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No. 1

## Henry Ford's Proposal to Substitute the Jitney Bus for the Ship of State Scored

THE following open letter to Mr. Henry Ford, pointing out the fundamental mistakes contained in his proposal to spend \$10,000,000 to prevent the progress of the movement to strengthen the defenses of the United States, has been written by Mr. Henry Woodhouse, a Governor of the Aero Club of America, and member of the Conference Committee on National Preparedness. A dispatch at date of writing advises that Mr. Henry Ford has invited the assistance of Mr. William J. Bryan in replying to this letter.

My Dear Mr. Ford:

It is only four months since you and I discussed the fundamental factors which may evolve world-peace—and here you are offering to spend \$10,000,000 to oppose the "Preparedness Movement," while I am a member of the Conference Committee on National Preparedness!

Both of us earnestly desire to attain the same object—the maintenance of peace—but our methods in trying to attain that object are as widely different as can be, and it seems to be your purpose to actually offset the results of the work of my associates and myself.

Both of us are sincere, yet one of us is wrong, and if the newspapers have quoted you correctly, you are fundamentally so, and the \$10,000,000 you are about to spend will not offset present evil influences, but will assist in staging another war—a war on this country!

As you surely are wrong in more than one instance, I shall go over each count in detail. But I first must assure you, Mr. Ford, in all frankness, that your proposal to substitute the jitney bus for the Ship of State is not, and never will be, taken seriously.

When your announcement that you would spend \$1,000,000 in an attempt to oppose the National Preparedness Movement was published broadcast, the whole country smiled, and your advertising manager was credited with exceptional ingenuity, acumen and enterprise. When you increased the amount to \$10,000,000, you acquired a "nuisance value," but just the same, Mr. Ford, the proposal to substitute the jitney bus for the Ship of State is too preposterous to be taken seriously.

Some of the points in which you err, and which I feel compelled to point out to you, are as follows:

1. You seem to be swayed or obsessed with an idea that this country is in the grip of "the war spirit." Nothing could be further from the truth, as one who keeps in touch with conditions must admit. The people of this country have been unusually thoughtful, patient and conservative throughout the recent and present trying circumstances.

The only thing that can be said of the patriotic workers for the improvement of our national defenses is that they are far-seeing patriots, and of the American press is that they are heartily pro-American.

2. You have said:

"Must we kill our men because some foolish Americans will voyage on ships that are in danger, when they might use equally good ships that are safe—or better still—stay at home."

This is a very unwise utterance. If you do not know why, I advise you to read President Wilson's notes to Germany.

3. In your expectation that spending \$10,000,000 in a campaign against the movement to improve the country's defenses will result in evolving peaceful conditions, you overlook that the consequences would be the end of the Monroe Doctrine, the advent of competitive armament in America,

and that your \$10,000,000 would really be spent to stage a war on this continent.

The United States has assumed the responsibility of protecting the South and Central American countries, and, thanks to the Monroe Doctrine, which undoubtedly is one of the doctrines most seriously considered by European nations, there has been no need for armament on the part of South and Central American countries.

We find, therefore, a huge continent, fertile with rich resources with hardly any resources, any armies or navies. The American Republics have, together, less men in military service and smaller battleship tonnage than any one of the first-class European powers.

But the United States has not increased its protection in proportion to the need; and, therefore, has jeopardized the future peace of this continent. The Balkan war first, then the present war, prevented nations coveting the riches of South and Central America from taking advantage of the helplessness of the United States.

When the nations, within the last twelve months, discovered our defenseless condition, the South and Central American countries were in the throes of financial difficulties, due to withdrawal of foreign capital, therefore nothing could be done to organize armies and build navies. If they are assured of reasonable protection, they will not undertake to supply their own means of defense; if they are not, they will strive to provide their own armies and navies, which will introduce competitive armament.

The other aspect is the actual helpless condition of the United States. The leaders of the movement to improve the national defenses found the conditions so shocking that it was deemed wise not to make their finds public, lest the general public might become alarmed and force some extreme measures, and so as not to attract attention to this country's helplessness.

If you start your ten-million-dollar campaign against the movement to improve the defenses, the million members of the organizations interested in national defense may find the influence of your money a national danger, and to counteract that influence may have to make public the truth about our defenselessness.

I shudder at the thought of what might result if the defenseless conditions of this country are made public and no steps are taken to meet the needs.

You do not want to proceed with a plan which may result in using your money to precipitate a war on this continent, and you owe it to the nation as well as to yourself to not take any steps before you have investigated the nation's needs and problems, for I cannot conceive that you would take the stand you have if you fully investigated our country's needs.

I feel confident you will find that what is being done now is meeting the issues with dignity and firmness, and that by contrast what you propose to do is to attempt to jitney "Uncle Sam" through the perilous road of uncertainty.

You condemn the military element of this country as "militaristic parasites." You are absolutely wrong in your animosity, and owe them an apology for the insult, for they have proven themselves practical benefactors, missionaries of higher civilization. For instance, Major General Leonard Wood, the person who, as the leader of the "Preparedness Movement," comes in for your bitterest condemnation, did for Cuba during the American occupation more than could be expected of a missionary.

The Cubans were taught the Ten Commandments of living, were given an ethical code, and when the military occupation ended, Cuba was a hundred times better than when the occupation took place.

The high value of civilized militarism was also shown in the occupation of Vera Cruz by the United States forces. They gave that section order, protection, sanitation, and a new



standard of living. Missionaries could not have done better.

It is well to understand, also, before condemning, that the militarist is the man of today, the man who faces the stern situation as it exists, and who, being intrusted with the important tasks of defending his country and maintaining its prestige, and supporting its interests, cannot afford to indulge in dreams of what could be. Being responsible for the country's safety, he must not deal with the other countries' possible good intentions, but must be ready to meet gun with gun, dreadnaught with dreadnaught, aircraft with aircraft.

At first consideration it seems a thorough preparedness were opposed to internationalism, which you and I would like to bring about, but when we consider that an army's purpose is to defend its country's interests as defined by the people of the country, we realize that it would as easily and faithfully defend a world-nation against individual lawlessness, and is a necessary and powerful agent of civilization.

One thing is certain—although you do not seem to realize it—and that is that millions of people sleep peacefully at night because of the sense of security which our military establishment affords us. We should thank the powers that be that we have soldiers to protect us—not abuse them.

5. Your expressions of regret over the fact that thousands of representative women have joined the movement to promote peaceful preparedness remind us that in our discussion of the most substantial factors that may evolve world-peace, you held that women would bring about a state of permanent peace.

You are wrong in condemning their activities. Were you familiar with their aims and purposes you would encourage their work. They are doing exactly what you would have them do—striving to prevent war, to change the conditions which threaten to take the men of their families from them, to make them helpless sacrifices for murderous guns—and wreck their homes and take from them the things that make life worth living.

Do not attempt to discourage them! You would not succeed—fortunately, since the exercise of their womanly and motherly desire to protect their loved ones will when conditions have changed, do much toward bringing about just what you and I would like to see—the brotherhood of men.

6. In your statement you speak of "huge" armies; "vast" navies, and other superlative, intended to convey the idea that this country has, or is planning to get, armies and navies of tremendous size. If you had taken the trouble to inform yourself regarding the Army and Navy, you would know that they do not include as many men as the Ford factories and shops have. You probably have larger armies working for you, either directly or indirectly, merely to supply a very small part of the American public with a commodity, than this great nation has available to insure the country against foreign aggression, and for the preservation of American institutions at home and American rights abroad.

One thing is certain, and that is, that the 20,000 men working daily in the Detroit Ford plant represent 5,000 above the number of men in the Army proper, and the War Department could mobilize. Any of your minor branches employ more men than are to be found at some of the forts intended to guard the approaches of such an important city as Philadelphia. A dozen men is all that you will find at one of the most important forts! Our Army and Navy have only about twenty trained aviators, which is less than is employed by the Curtiss Aeroplane Company alone.

The Army and Navy together aggregate only 145,000 men, although the population of the United States is about 102,000,000. Investigation will undoubtedly show that you employ a larger number of watchmen in proportion than Uncle Sam is employing—and you have the services of the police besides! Likewise, whereas the Army and Navy have cost less than \$240,000,000 a year, to protect wealth valued at \$187,739,000,000, you will probably find that you have been paying much more in insurance and watchmen's salaries, and that besides the protection afforded you by the fire and police departments, paid for by the community.

You have been emphasizing the fact that \$1,000,000,000 worth of ships, guns and general equipment have deteriorated unused, and you consider that an argument against having adequate preparedness. That sum seems enormous until you find that this armament protected this nation while it increased the national wealth from \$7,136,000,000, in 1850, to \$187,739,000,000, in 1915! You must admit that it was a good investment.

7. To show your patriotism you have said: "Let any hostile army today, or at any other time, move against the United States, and anything that I have is at the disposal of the United States for defense." In view of this country's

defenseless state, and that wars are attended by swift operations and ghastly surprises, I am tempted to point out that if a first-class power moved against the United States your wealth might be needed to pay tribute instead of providing means of defense. Our citizenry is helplessly untrained, and it would have to surrender or be mowed down.

Mr. Henry A. Wise Wood, the Chairman of the Conference Committee on National Preparedness, recently related that in the archives at Washington there is a document which sets forth the celerity with which these very seas may suddenly be used for an attack upon us. According to its contents, which give the numbers of men, each of several nations could land upon our shores within a given period of time, it lay within the power of one of these nations to set down upon our Atlantic coast, in 46 days, over 750,000 men, with artillery, sufficient ammunition and supplies to last them for three months. And on our Pacific coast, it was stated, in 61 days there could be landed approximately 350,000 men, with supplies and weapons.

It would require at least five years to get and train men to meet this contingency. Therefore, the plans to increase the Army to 300,000, and to provide for training that part of the citizenry which is willing to train while being employed daily in peaceful pursuits, cannot be considered as anything more than a conservative precaution. Nor can the plan to spend \$17,500,000 for aeronautics—\$7,500,000 for the Navy, \$5,000,000 for the Army, and \$5,000,000 for the Militia—be considered excessive.

This country is aerially unprotected. At this time, when the reviews of one year of war show the important part played by aircraft; when it is shown that the Russian defeats and surprises have been due principally to lack of aeroplanes and aviators on the Russian side, while Germany employed hundreds of aeroplanes and trained aviators; when each day brings ghastly threats and surprises to American ideals, American interests, and American lives, emphasizing the necessity of having adequate means of defense, we must realize that, having only twenty aeroplanes in the Army, Navy and Militia, places this country in a pitiful, dangerous and helpless condition.

You will not, therefore, have proven your patriotism until you have followed the example of those patriotic organizations which have given their employees every inducement to join the National Guard or Naval Militia and share the responsibilities of the Nation.

I must confess that your boasting of the fact that less than ten of your 20,000 employees at the Detroit plant attended the recent encampment of the Michigan National Guard, strikes me as being not only unpatriotic, but positively disloyal.

8. Your attack upon the organizations which are working for the improvement of our national defenses is most unfortunate. Had you investigated them, you would have found that they are aiming to do exactly what you are aiming to do, that is, to prevent war. They believe that peaceful preparedness is to the ill of war what prevention is to all other ills—the best cure—and they are giving their time, efforts and financial support.

The million members of the organizations represented on the Conference Committee on National Preparedness and affiliated organizations are men and women whose only interest in the movement is to evolve peacefully the system of national defense needed to insure this country against foreign aggression, the preservation of American institutions at home, and the maintenance of the broad rights of humanity.

Intelligent people do not require an explanation; therefore, I need not moralize to you, Mr. Ford, at the conclusion of this letter. But I consider it a duty to point out that conditions now are in many ways like the conditions which existed in 1793, when President Washington, in his address to Congress, said:

"I cannot recommend to your notice measures for the fulfillment of OUR duties to the rest of the world, without again pressing upon you the necessity of placing ourselves in a position of complete defense, and of exacting from THEM the fulfillment of THEIR duties toward US. There is a rank due to the United States among nations, which will be withheld, if not absolutely lost, by the reputation of weakness. If we desire to avoid insult, we must be able to repel it; if we desire to secure peace, one of the most powerful instruments of our rising prosperity, it must be known that we are at all times ready for war."

To prevent war is the only thought of the million members of the organization represented by the Conference Committee on National Preparedness, as it is yours. The following excerpt from an address written by Mr. Henry A. Wise Wood, the chairman of the committee, for the Governors'

(Continued on page 18)



# THE NEWS OF THE WEEK

## Twenty Martin Seaplanes for Dutch Government

Dispatches from Los Angeles announce that Glenn L. Martin has scored a new and valuable achievement in the perfection of the new model T. A. Martin seaplane.

This is an unusually efficient and dependable machine, as is evidenced by the fact that two new records have already been made with it. Lieutenant ter Poorten, of the Dutch Aviation Corps, broke the Los Angeles-San Diego non-stop round trip record with it, making the 224 miles in three hours and 25 minutes.

Lieutenant ter Poorten and Captain Visscher also officially broke the passenger hydroaeroplane altitude record. They attained an altitude of 7,500 feet, and were up one hour and thirty minutes. The record in this flight was taken by Captain Arthur Cowan, of the I. S. Army Aviation Corps.

The new machine was subjected to several severe tests, among other trials carrying a one-half ton load of merchandise.

Agents of The Netherlands who witnessed the various tests were highly pleased with the behavior of the new seaplane, and are purchasing twenty machines for early delivery.

## Vincent Astor Makes Flight in His New Flying Boat

Vincent Astor, on Thursday, made two flights at Marblehead in his new flying boat. Both flights were successful, and Mr. Astor seemed greatly pleased. Among the hundreds of spectators who witnessed his first flight was his wife, who, after congratulating her husband for his good work, took a train for Newport.

"Cliff" Webster acted as Astor's pilot. The first flight was made shortly after 9 o'clock, and another was made near noon. On the first flight, after planing about the harbor, the machine was driven to an altitude of about 500 feet.

## Harry Payne Whitney's Hydro-aeroplane Passes Test.

Harry Payne Whitney's 100-horsepower Burgess-Dunne hydro-aeroplane has finished its tests at Marblehead, and will be shipped to the Whitney estate at Roslyn, L. I., this week.

The hydro-aeroplane is in appearance almost identical with that built by the Burgess Company for Vincent Astor.

Mr. Whitney plans to use the machine at his country home at Roslyn, L. I. Mr. Clifford L. Webster will accompany the hydro to Long Island, and will instruct Mr. Whitney as to its operation.

## Dayton Wants the Factory

Orville Wright has signified his intention of giving up the manufacture of aeroplanes and devoting his time to the development of the aeroplane motor. From this announcement residents of Dayton have arrived at the conclusion that Mr. Wright may sell and the business may be moved to another city, and the Greater Dayton Association has started a movement to keep the industry in that city.

## The "Canada" Accepted by the British Authorities.

The official military test of the giant aeroplane Canada, the first of the fleet of "air destroyers," ordered by the British Government, took place on Tuesday of last week at the flying grounds in Toronto and resulted in an immediate acceptance of the machine.

The details of the test were published in a letter reproduced in the *New York Times*, written by an aviator who witnessed the tests.

"The Canada exceeded all requirements by more than a fifth," the writer in the *New York Times* says, "and was accepted just as it lay on the ground after the final flight. Carrying a load of 2,000 pounds, it rose from the ground with ease and great speed, and when in full flight attained a speed of ninety-five miles an hour.

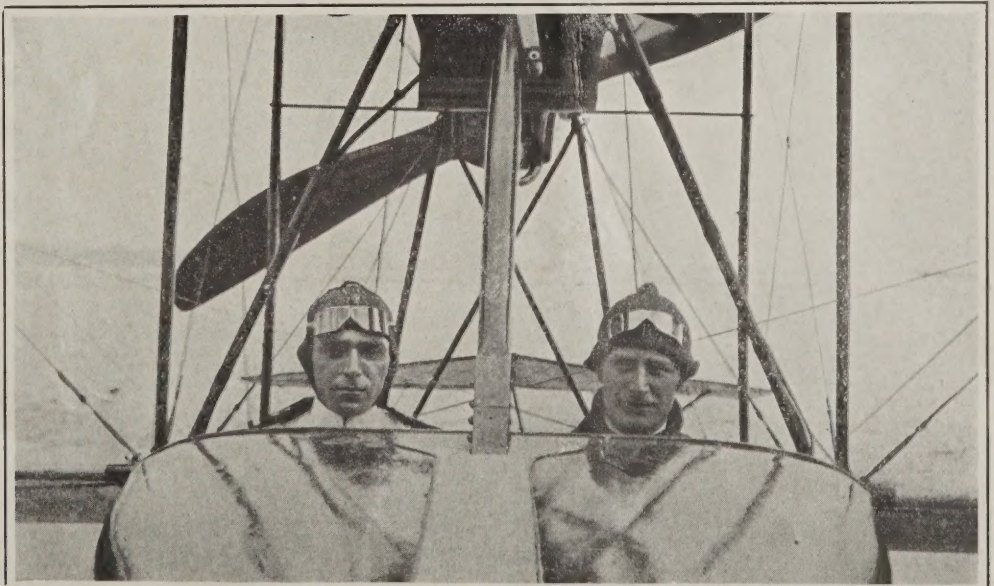
"The tests were witnessed by a number of British officers and officers of the allied powers, and were under strict military supervision. No strangers were allowed inside the flying grounds, and detectives and uniformed police promptly 'moved on' any persons seen loitering in the neighborhood. Antony Jannus flew The Canada, both with and without load, and a number of the military men went up. They were very enthusiastic at the end of the test, and said that the 'air destroyer' was the greatest machine of its kind ever built.

"Every part of the machine is American and designed by firms in the United States. Its wings are 80 feet from tip to tip, and the carriage projects six feet in front and behind the wings. With two rapid-fire guns this will allow the crew of the 'destroyer' to absolutely command the air, both in front and behind. Further, as the guns will be clear of the wings, they will have an unlimited range both up and down, and will be able to attack aeroplanes above them, which is unusual in aerial warfare, as it has always been necessary for the aviator to climb above his enemy before he can deliver the death blow.

"There are two propellers, driven by two 160 horsepower 'V' type motors, developed especially for the 'air destroyer' type by the Curtiss Company, and one of the most remarkable things about them is that they ran without any vibration whatever.

"The Canada is of what might be called the double fuselage' type and is a biplane. The carriage or body is designed on the 'stream line' type, with the idea of offering the least amount of resistance to the wind. The Sperry stabilizer attachment worked perfectly at the trials. It is attached to the ailerons in the tail of the machine, and is so arranged that control is automatic. The pilot can entirely disregard the controls and devote his time to bomb-dropping when necessary. This is a further advantage, in that long trips may be made with the minimum of exertion to the pilot. Of course it makes The Canada as safe as an aeroplane can be up to date.

Mr. A. J. Engel (on the left) the Curtiss aviator, who has just left America with a shipment of aeroplanes for Spain, and Lee H. Harris (on the right), who, upon completing his course in aviation at Buffalo, will take charge of the first aviation squadron of the New York Naval Militia.







Jay Smith in his Benoist Flying Boat.

"The bomb-dropping device, which is attached in part to the stabilizer, and arranged so that the aviator may always know the position of the machine in regard to the horizontal, makes it practically certain that the bomb will strike the object aimed at. According to the service on which it is used, The Canada will carry bombs weighing 25, 50, 80, 125 or 200 pounds. It can carry ten of the latter, weighing in all a ton, and with the certainty of striking attained by the new device, will be able to blow a town almost off the map. The Zeppelins do not carry bombs as large or destructive as these.

The Canada is superior to the German Aviatik type, which is the largest they use. This was the type of machine that killed Pegoud, and while it has a speed of between sixty-five and seventy miles an hour, The Canada type can do better than ninety miles and that will give them a tremendous advantage in air battles. Another feature of this type is the great strength of their construction. Many of the uprights are six inches thick, and all the struts and reinforcements have been designed with the idea of standing great shocks.

"J. A. D. McCurdy of the Curtiss Aeroplane Company, built The Canada, and is under orders from the British Government to build an unlimited number as fast as they can be turned out. Charles M. Manley, who was formerly associated with the late Professor Langley, watches the con-

struction work for the British, and every nut and bolt used, as well as the greater parts, has to have his 'O. K.' before it is put in place.

"It was the opinion of the officers who watched the tests that these 'air destroyers' would be the most deadly weapon yet developed during the war. The Canada will be shipped immediately and will be followed by others just as fast as they can be built.

"Complete, The Canada cost about \$40,000, but now that the type has been standardized, it is expected that they will cost about \$30,000 apiece. The first squadron of twenty, which will be shipped before October, will have cost the British Government about \$610,000.

"Several of the Canadian aviators trained at the flying grounds in this city (Toronto) will accompany The Canada when she is shipped at the end of this week. They have watched the machine built and have been trained to fly it. Aviators will accompany each one sent over, and it is expected that there will be at least two aviators for each machine when the 'air destroyer' squadron is fully organized.

"After consideration and watching The Canada perform, the officers of the Allies gave it as their opinion that the type would prove much more useful and destructive than the German Zeppelins. They have the mobility and speed of the fastest scouting aeroplanes and can carry a ton of explosives which can be dropped with accuracy, while the Zeppelins are slow and cannot aim their bombs."

#### Twenty Aeroplanes for Spain

A shipment of twenty Curtiss aeroplanes for the Spanish Government left New York last week on the steamship Roma, bound for Gibraltar.

The shipment is in charge of Captain Juan Vinegra of the Spanish Army, who learned to fly while here. With him is Al. J. Engle, a flying instructor of Buffalo, who will instruct the officers of the Spanish Army and establish a military flying school at Madrid.

With another officer Captain Vinegra visited all the important aviation centers, and said that as a result of his investigations he thought American aeroplanes superior to those in use abroad.

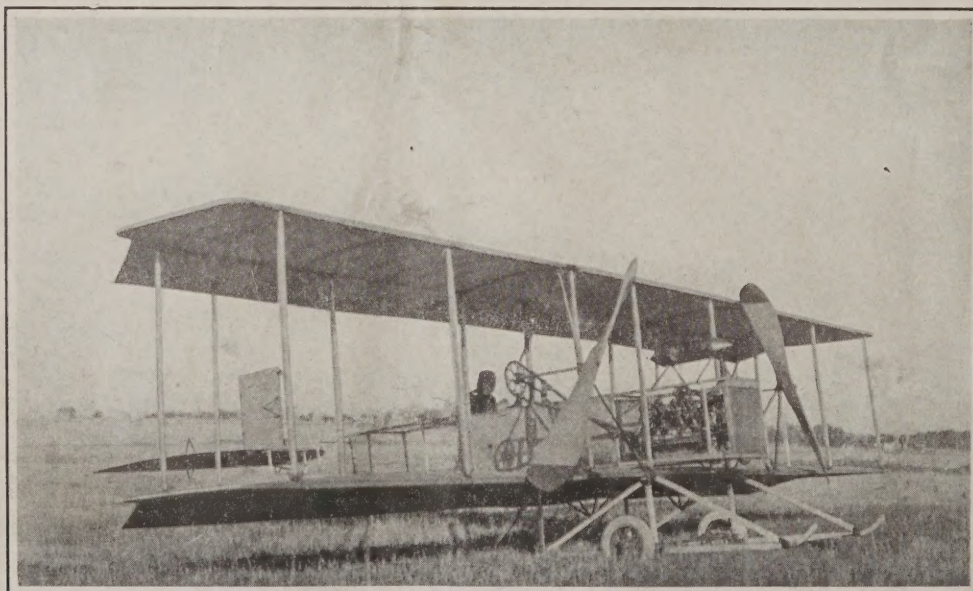
#### Clifton Cook To Fly at Chattanooga

After having successfully gone through a course of tuition at the Curtiss Aviation School at San Diego, Clifton Cook is returning to Chattanooga, where he will give regular exhibitions, using one of the late Lincoln Beachey's machines. Cook is only seventeen years of age, but he made an enviable record among the students at San Diego for his skill.

#### Nine American Aviators with French Army

William Thaw, the American aviator, states that nine Americans are serving as aviators in the French Army. Eleven others are in training.

The nine are: Norman Prince, Elliot Cowden, James Bach, Frazier Curtis, H. G. Guerin, Burt Hall, Didier Masson, Charles Weymann and Thaw.



The double propellered Biplane constructed by H. G. Cliff, of Denver, Colo. The power plant consists of a 60 h.p. Hall Scott engine, and the propellers are of the Burgess type.



### Naval Advisors Named

The makeup of the Naval Advisory Board of Inventions, the organization of experts who will contribute their inventive genius to the Navy, of which Thomas A. Edison is to be the chairman, was announced by Josephus Daniels, the Secretary of the Navy, last week.

The board will consist of twenty-three members, including Mr. Edison, who was selected by Mr. Daniels to serve as the presiding officer of the board.

The other twenty-two members of the board who were chosen by ballot by eleven of the principal scientific societies of the country whose members deal with those branches of science on which the Navy is thought to be dependent for invention, are:

American Society of Aeronautic Engineers: Henry A. Wise Wood, New York City, and Elmer A. Sperry, Brooklyn.

American Society of Automobile Engineers: Andrew L. Riker, Detroit, and Howard E. Coffin, Detroit.

American Institute of Mining Engineers: William Laurence Saunders, New York, and Benjamin B. Thayer, New York.

American Electro Chemical Society: Joseph William Richards, South Bethlehem, Penna., and Lawrence Addicks, Chrome, N. J.

American Society of Mechanical Engineers: William Leroy Emmet, Schenectady, N. Y., and Spencer Miller, South Orange, N. J.

American Chemical Society: W. R. Whitney, Schenectady, N. Y., and L. H. Baekeland, Yonkers, N. Y.

American Institute of Electrical Engineers: Frank Julian Sprague, New York City, and R. G. Lamme, Pittsburgh, Ohio.

American Mathematical Society: Robert Simpson Woodward, Washington, D. C., and Arthur Gordon Webster, Worcester, Mass.

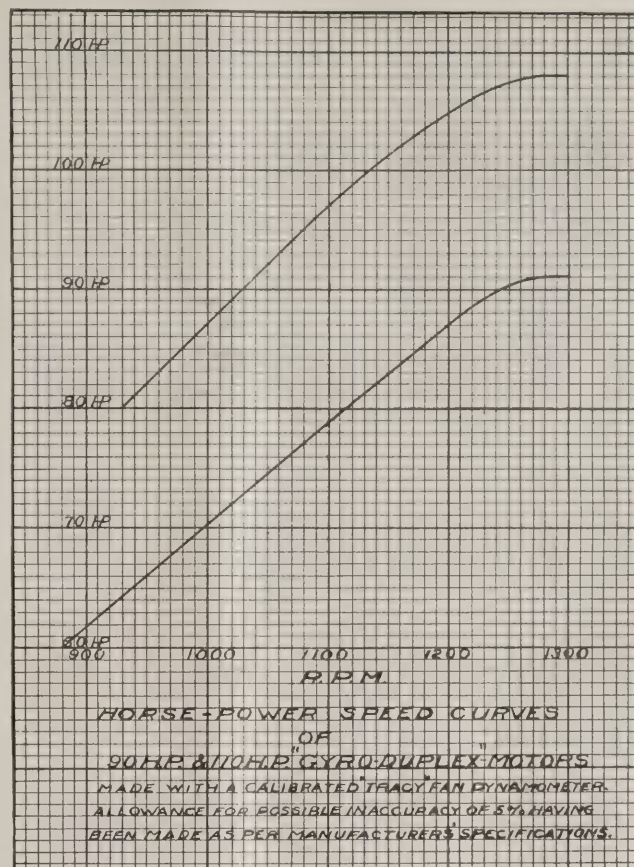
American Society of Civil Engineers: Andrew Murray Hunt, Naval Academy, New York City, and Alfred Craven, New York City.

American Aeronautical Society: Matthew Bacon Sellers, Baltimore, Md., and Hudson Maxim, Brooklyn, N. Y.

The Inventors' Guild: Peter Cooper Hewitt, New York City, and Thomas Robbins, Stamford, Conn.

The first general meeting of the board has been called for Wednesday, October 6, in the office of Secretary Daniels, in Washington.

It will be remembered that the American Society of Aeronautic Engineers, at the time of appointing its representatives to the Advisory Board, also appointed a committee to advise these representatives, as follows: Orville Wright, Glenn H.



Above is the power curve of the 7 and 9 cylinder Gyro motors. In flight the full consumption of these motors is as follows: 7 cylinder—90 H. P. Duplex, 8 gallons of gasoline per hour, 1¼ gallons of castor oil per hour. 9 cylinder—110 H. P. Duplex, 10 gallons of gasoline per hour, 1½ gallons of castor oil per hour.

Curtis, W. Starling Burgess and Charles M. Manly, to advise on matters pertaining particularly to the theory and construction of aeroplanes and aeronautical motors; Peter Cooper Hewitt, John Hayes Hammond, Jr., and Joseph A. Steinmetz to advise on matters pertaining particularly to the application of aircraft for warfare; Captain Thomas S. Baldwin, A. Leo Stevens, Ralph H. Upson and Raymond B. Price to advise on matters pertaining particularly to dirigibles, balloons and parachutes.

P. C. Millman, and his class of students at the Business Men's Camp, Plattsburg. The machine shown in the picture is the Gallaudet Military Tractor.





# THE NEW CHRISTOFFERSON FLYING BOAT

By WALTER H. PHIPPS

The new Christofferson flying boat, while differing very slightly from former models, is one of the most interesting craft of this type which has yet been produced, and probably represents the nearest approach so far to a large comfortable motor boat fitted with wings.

The hull is long and roomy, and seats three persons comfortably. The following is a detailed description of the craft:

The main planes have a top span of 49 feet and the bottom is 33 feet 6 inches. The chord is 5 feet 6 inches, with a camber of  $3\frac{1}{2}$  inches, 2 feet 2 inches back. The trailing edge of the top plane is cut out for the propeller travel and near the ailerons it flares out to 6 feet 6 inches, thus bringing the ailerons in as an extension of the same section, with the exception that the top of the aileron has a reverse camber of  $\frac{3}{8}$  inch. The ailerons are 2 feet 6 inches wide and have a total area of 55 square feet. These ailerons, of which there are two, on the top plane only, both work in conjunction, giving a considerable amount of control. The angle of incidence of the main planes is  $5\frac{1}{2}$  degrees. Total area of the main planes is 432 square feet.

The ribs of the main planes are of I-section and are built up. The battens are  $\frac{1}{4}$  inch by  $\frac{1}{2}$  inch. The web which is bored out for lightness is  $\frac{3}{4}$  inch thick. The web is mortised into each batten, then glued and nailed. The main beams are also I-section and are formed by a 3 laminee web of  $\frac{3}{4}$  inch thickness, which is also mortised into two solid strips which are  $1\frac{1}{8}$  inches by  $\frac{3}{8}$  inch. The thickness of each main beam is  $1\frac{5}{8}$  inches at the hull and out to a short distance from the tips. There they are thinned down to 1 inch in thickness. Oval strips  $\frac{7}{8}$  by  $\frac{3}{8}$  inch, run diagonally inside of each plane with several small tapered strips between the end ribs.

The construction of the main planes is spruce throughout. There are three sections in the top plane and two in the bottom. The gap is 5 feet 6 inches. An interesting point about the main plane section is that the entering edge is in two strips with the outer strip sharply pointed. The trailing edge is of one spruce strip with an oval-leaving edge. The main planes

and controlling surface are covered with Irish linen treated with "Christolite". Roebling cable is used throughout, the main planes being braced by  $\frac{1}{8}$  inch diameter cable.

The struts are of spruce and are  $1\frac{1}{8}$  inches by 3 inches and tapering to 1 inch round at the ends. The four center struts are of spruce, oak and spruce, with the outer laminations of oak. There are four laminations. These run down on the inside of the hull and are securely fastened on the keels.

The hull, which is the most interesting of all, is 24 feet 6 inches long. The maximum width is 34 inches, which occurs at the rear of the hood and continues back to a distance just back of the propeller. From there it rounds off on the sides and flattens to a wedge at the stern. The bottom is curved up 12 inches at the bow and is flat to a distance of 9 feet back from the rear of the hood. From there it rounds off to a sharp point at the stern. The top is covered at the bow by a hood covered with  $\frac{1}{8}$  inch thick mahogany. It is then left open for the pilot and passengers. At the rear of the propeller it is slightly concave for a short distance, whence it rounds up again and tapers back to the stern. There are two small doors on either side of the hull, just in front of the passengers' seats. These are to make it easier to enter the boat. A step occurs 16 feet back from the bow. This step is varied in depth from zero to 6 inches by a small lever placed alongside of the pilot's seat. The bottom of the step is concave in form and is 28 inches wide. There are two runners on the bottom of the hull which are  $2\frac{1}{2}$  inches by 1 inch spruce. They taper at the front and at the rear. The interior of the hull is braced by  $\frac{1}{4}$  inch by  $\frac{1}{2}$  inch spruce up-rights and by  $\frac{1}{2}$  inch by 1 inch spruce longitudinals. The ribs are  $\frac{1}{2}$  inch thick and are 1 inch wide. These are also of spruce. The sides of the hull on the outside are covered up to a distance of 14 inches from the bottom with  $\frac{1}{8}$  inch thick mahogany. The maximum depth is 2 feet 6 inches.

The pilot and passengers' seats are covered with leather and are quite roomy.

Wing pontoons of unique design are placed at a short distance from the tips of the planes. The "cans" are flat on the bottom and are flared out at the rear. The tops are oval at the front and flatten out at the rear.

The stabilizer is 4 feet 9 inches long and has a maximum width of 9 feet. It has a 1 inch camber and is placed at 1 degree. The area is  $24\frac{1}{2}$  square feet. The material is of spruce and ash. The ribs are I-section and of spruce, while the outer edge is of spruce and ash. The rudder is of the balanced type and is 4 feet 3 inches at the widest. The minimum width is 3 feet 3 inches. The height is 3 feet and the area is  $9\frac{3}{4}$  square feet. It is made to act as a water rudder when the machine is in the water and running at a moderate speed.

The elevators are splayed out considerably and give plenty of room for the rudder movement, which is advantageous in that the rudder will never become jammed, as has happened in a great many cases. The overall width of the tail is 12 feet 6 inches. The area of the elevators is  $34\frac{1}{3}$  square feet. The ribs are of the same material as those in the stabilizer. A noticeable feature is the construction of the main beams of the elevators and stabilizer. The entering edges are hollowed out and the ribs are set into the hollow. These taper down to the rear edge.

The motor, a Curtiss or a Hall-Scott, is now mounted up between the planes, instead of in the hull, as formerly, and drives the propeller direct, although the machines can be furnished with the motor in the hull if desired.

The control is either Deperdussin or Curtiss type, as desired.

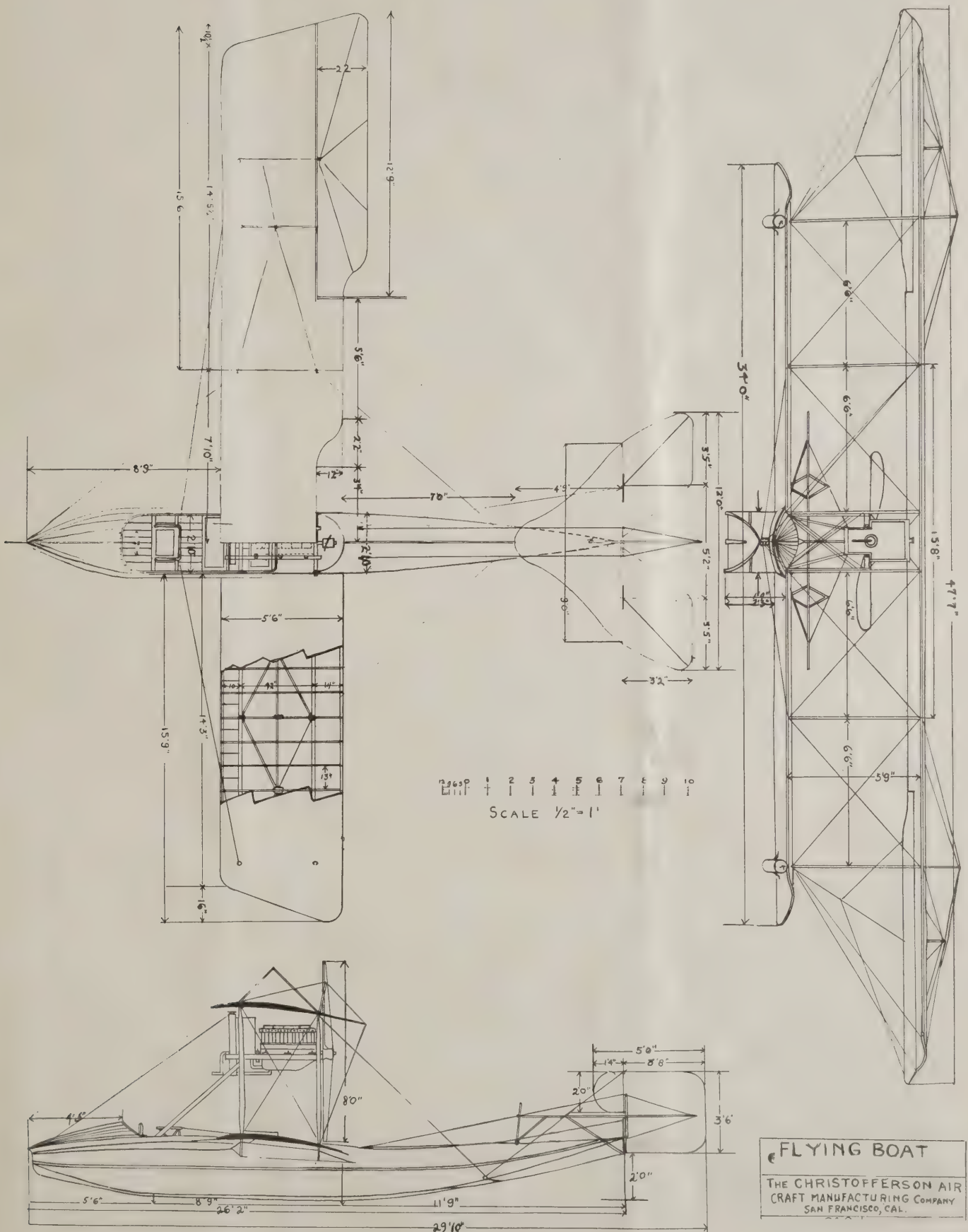
Mr. Silas Christofferson will bring two of his flying boats to New York next month, where he will demonstrate their special features to agents of foreign governments who are interested in purchasing this type of machine. The demonstrations are awaited with a good deal of interest.



The Christofferson flying boat.



# SCALE DRAWING OF THE CHRISTOFFERSON FLYING BOAT



FLYING BOAT  
THE CHRISTOFFERSON AIR  
CRAFT MANUFACTURING COMPANY  
SAN FRANCISCO, CAL.





Flying Officers and Staff Officers at Pensacola

## ACTIVITIES OF THE U. S. NAVY AERONAUTIC STATION AT PENSACOLA

Flying conditions have been unusually good, and there has been continuous flying throughout the past week. The recently assembled class of student aviators are progressing with remarkable rapidity and will soon be flying alone preparatory to taking the prescribed tests before being designated as navy air pilots.

Lieutenant L. H. Maxfield, U. S. Navy, has been detached from the aeronautic station and ordered to the works of the Goodyear Tire and Rubber Co., at Akron, Ohio, for instruction in free balloon work. Lieutenant Maxfield will, in all probability, be assigned to duty in connection with the new Navy dirigible.

Several successful experimental flights have been made in a Curtiss hydro-aeroplane, equipped with the new Wright control.

Lieutenants P. N. L. Bellinger and E. W. Spencer, Jr., U. S. Navy, have returned from Fortress Monroe, Va., having completed a successful experimental spotting from an aeroplane practice in conjunction with the Fall firing of the mortars at Fortress Monroe. This experimental spotting marks the first attempt at co-operation between the Navy Aeronautic Service and the Army in controlling the fire from the shore batteries, and the success of the venture has been highly pleasing and satisfactory. Spotting was done from a Burgess-Dunne seaplane, equipped with a Gyro motor. Due to motor troubles the machine was unable to lift both pilot and observer, so that Lieutenant Bellinger was obliged to

control, simultaneously, the aeroplane and the fire from the batteries. That both were done successfully is evidence of the skill of the pilot.

Several new machines of the hydro-aeroplane type are expected to be delivered at the Aeronautic Station within the next few weeks. In addition to the Burgess-Dunne and the Curtiss types, two Thomas tractors have been ordered, which, upon delivery, will constitute the first lot of this make of aeroplane to be tried by the Navy. Heretofore the Navy has confined its work in aeronautics entirely to pusher machines.

It is hoped that a new class of student aviators will be assembled and ordered to duty at the Aeronautic Station on or about October 1, 1915. This class will be composed of eight line officers of the Navy and two officers of the Marine Corps.

Upon the arrival of the U. S. S. North Carolina at the Aeronautic Station the aeroplane launching device, which has been successfully operated, will be installed thereon, and extensive experiments of launching aeroplanes from ship-board will be conducted. This work will be in the nature of a preliminary step toward ordering aeroplanes to the vessels of the U. S. Atlantic Fleet. The value of co-operation between aeroplanes and the fleet has been proven beyond the question of a doubt by the lessons from the present war in Europe. Skilled and qualified naval air pilots are being held in readiness to be ordered to the fleet when aeroplanes are available for that work.



Enlisted Personnel U. S. Navy Aero Station at Pensacola





## FRANK GOODALE TO TUTOR DIRIGIBLE SCOUTING

**C**HAMPION FRANK GOODALE may go abroad very shortly to teach the manipulating of a "dirigible" for warfare. He has made a contract with A. Leo Stevens to teach ten pupils per week the art of operating a "scouting dirigible."

Frank Goodale is a native of Michigan; he started in making his first flight some seven years ago and since that time holds the world's record for dirigible flights. He has made at Palisade Park, opposite New York City, alone in the five years 653 flights. He has performed above every large city of any note in this country, including the famous resorts, touring South America in 1912 and giving a number of exhibitions through Mexico.

There is no man living that can handle a machine with the cleverness of this operator when it comes to getting into any small space.

Stevens, the famous New York aeronaut, has watched this wonder with considerable thought, and has closed a contract to have him teach pupils the manipulating of airships which he is now constructing in his New York and Hoboken factories.

This season, prior to going abroad, Goodale will give a number of exhibitions in the larger cities, showing the ease in which he operates his latest machine.

The dirigible that Goodale operates is but of  $7\frac{1}{2}$  H. P. It

has a length over all of 65 ft. and a diameter of but 15 ft. 6 in. It is made of the lightest Japanese silk, weighing but one ounce to the square meter. It is made in block system, with templets running both vertical and horizontal.

The framework is 38 ft. in length by 14. in width and 14 in. in height. This is covered on the sides with an aluminum plate, making an extremely light engine room.

Close to the operator is placed a lever which is attached to a bomb-dropping device. Bombs are placed in a carrier and when the pilot wishes by merely pressing down on the lever he causes the explosives to be released.

Goodale is but twenty-seven years old; he balances the scale at  $127\frac{1}{2}$  lb., stands scarcely 5 ft. 6 in. Time and time again he has startled New Yorkers with his wonderful flying over the very heart of New York City.

In Stevens' latest contract he has guaranteed to carry mail at certain hours in the cities in which he will exhibit and carry special messages to some of the prominent people of the above places.

His larger machine which he will use of the "Stevens Type" is of 40 H.P., instead of the smaller one. The envelope will be considerably longer and wider, giving same greater displacement.



FRANK GOODALE





# FOREIGN NEWS



## FRANCE

Writing from Calais, France, at the date of July 30, a correspondent of the New York *Sun* describes as follows the visit of a Taube (or in fact of a German aeroplane of any denomination) to the city of Calais:

A Taube has just traveled over the coast and city. This is the time of day such scrutines of the enemy usually take place—near noon, when there are no shadows to spoil the perspective. The cannon from the fortifications began to thunder as soon as the "bird" appeared, and the streets filled with people, for no one seemed to have the slightest fear.

Some persons even climbed to the roof from windows in the top story in order to have a possible handshake with the pilot of the machine. The Taube scudded along among the clouds, no doubt taking observations of what was going on beneath, and after a few moments melted in the mist. The people here say this is to herald a visitation from the Zeppelin, and that "God willing," the Zeppelin will appear on the scene. That was the way with the last raid.

Friburg, the chief city of Baden, was visited by a French air squadron on September 6th. This attack, as the French official bulletin puts it, was "in reply to the bombardment of the open towns of St. Dié and Gerardmer by the German aeroplanes." Fires were set by the French missiles.

Other points, including Saarbarg in Rhenish Prussia, Lens, north-east of Arras and Perenne, have been the objects of air raids.

A German aeroplane flying at a great height appeared on September 6th over Chavannes, an Alsatian village on the old frontier. The aviator dropped a wreath which bore the inscription: "To Pegond, who died like a hero, from his adversary."

According to a letter, which was found on a captured German airman, the French aeroplane fleet has lately adopted a new set of rules regarding aerial tactics and strategy, which makes it practically supreme in the air.

The letter which was published by the Parisian Daily *Le Temps* reads as follows:

"My squadron has been withdrawn because the French aeroplanes now appear only in large numbers, either for reconnaissance or to bar our scouts systematically. The latter task is accomplished thus: Ten machines patrol our line at a height of 2,000 meters and ten more at 3,000, but flying in the opposite direction, so that if the German scout tries to get through he is attacked by the nearest two Frenchmen above and below simultaneously, others joining if the two are insufficient to stop him. Their bomb-throwing is operated with similar numbers. We must follow their example or yield command of the air."

Another series of attacks on strategic points behind the German lines has been carried out during the last week by French bombing aeroplanes.

The French War Office announced these raids as follows:

During the night of Aug. 26 our aviators bombarded St. Baussant and Essey, in the Woevre district.

In the Argonne section the railroad stations at Ivoiry and Cierges also were bombarded by French aeroplanes. This followed an attempt on the part of German aviators on Clermont-en-Argonne. The bombs thrown down on this position, however, by the Germans caused no damage.

During the night of Aug. 26-27 a French aviator threw down ten shells on a factory at Dornach, where the Germans have been manufacturing asphyxiating gases.

During the morning of August 28 a French squadron of aeroplanes bombarded the railroad station and the electric power house at Mühlheim, (probably Müllheim), in the Grand Duchy of Baden.

All the aviators returned unharmed.

## GREAT BRITAIN

Owing to the rapid expansion of the Royal Naval Air Service, both with respect to personnel and material, the Admiralty has decided to place it under the direction of a flag officer with the title of Director of the Air Service.

Rear Admiral C. L. Vaughan-Lee has been selected for this appointment. Commodore M. F. Sufter, the present Director of the Air Service, will be in charge of the material side of the naval aeronautical work, with the title of Superintendent of Aircraft Construction.

A German air raid on the east coast of England occurred September 7th. The official statement regarding the raid says:

"Hostile aircraft revisited the eastern counties Tuesday night and dropped bombs. It is known that there have been some fires and some casualties will be communicated to the press as soon as they can be obtained. This raid constitutes the nineteenth on England since the beginning of the war.

Six more aeroplanes have been presented by public subscription to the Royal Flying Corps, three being from Newfoundland, two from Bombay and one from Rhodesia.

## GERMANY

English sentiment regarding the renewed activity of the German airship fleet is voiced in an editorial of the London *Times*. It says:

"The official announcement circulated by the Press Bureau, states that Zeppelins again visited 'Eastern counties' on Tuesday night and dropped bombs.

"There is not the least sign of panic in this country about Zeppelin raids. The districts attacked, regard them very quietly and calmly. At the same time we find many indications of widespread public irritation because the official statements are so curt and obscure.

"Expressions of indignation against the Ministry on this point are for the most part extremely unfair. The authorities concerned, by suppressing information which might be useful to the Germans, are doing their best to shield the public from attack, but the fact remains that this feeling of irritation exists, and the government would do well to take account of it.

"In any case, we think they would be wise to issue an authoritative statement, both for neutrals and for this country, of the principles on which they are acting."

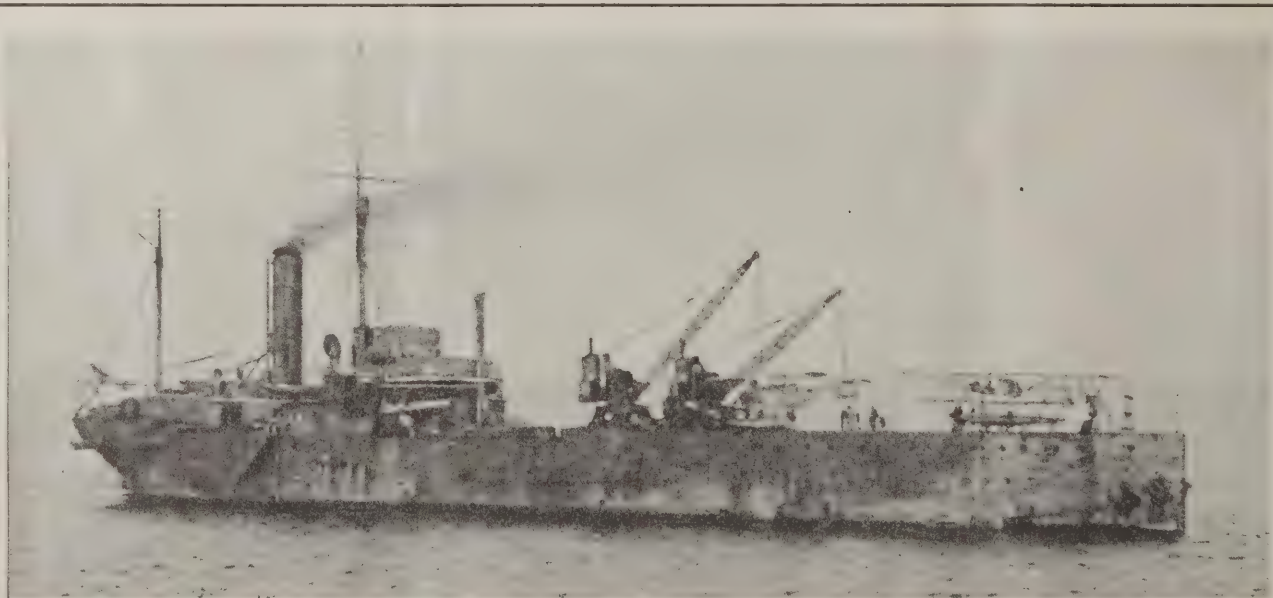
A dispatch from Copenhagen states that the new type of giant biplane undergoing tests in Germany is said to have a measurement of 42½ metres (about 46½ yards) across the plane. The motors develop 300 horsepower, and each works three propellers.

These biplanes are capable of carrying sufficient fuel for flights of eight hours. They are equipped with wireless and searchlights. Each carries twelve bombs weighing 22 pounds apiece and five machine guns.

At the aviation grounds at Rothhausen, Rhenish Prussia, an aeroplane of the Condor type, on September 6th, ascended 3,200 metres (about 3,500 yards), carrying four passengers.

## INDIA

The Gaekwar of Baroda has contributed \$160,000 to provide aeroplanes for use at the British front. Last December he purchased the steamship *Empress of India* as a hospital ship for Indian troops. Soon after the war began he offered all his troops and resources to aid the British.



The "Ark Royal", the British aeroplane ship which operates with the Allies' fleets at the Dardanelles. Great Britain has found the aeroplanes so valuable that Sir John French, with 1500 aeroplanes at his disposal, says: "I feel that no effort should be spared to increase their number and perfect their equipment and efficiency."





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1363 Townsend Avenue, Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 130, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**HARLEM MODEL AERO CLUB**  
73 West 106th Street, New York City  
**MILWAUKEE MODEL AERO CLUB**  
402 Bradford Avenue, Milwaukee, Wis.  
**CONCORD MODEL CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**AERO CLUB OF ST. LOUIS**  
Columbia Bldg., 8th and Locust Streets, St. Louis, Mo.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

## NATIONAL MODEL AEROPLANE COMPETITION

### First Contest Distance Results

With many clubs competing, and the establishment of a new world's record, the close of the first series in the model flying contest clearly indicates two things—first, the scientific value of model flying, and second, that national interest in the sport is pretty sure to increase with great rapidity.

Notwithstanding the fact that Wallace A. Lauder of Summit, N. J., established a new world's record for distance, the total established by the Summit Club falls below that of the Pacific Northwest Club, whose members are credited with uniformly good flights in the contest held at Harbor Island, Seattle. This club's average was 1267 feet as against 1265 feet, the average of the Summit Club.

Owing to delay in the transmission of the official report of the Illinois Model Aero Club of Chicago, the judges have deferred the announcement of the winners of the three prizes for the month.

Official reports filed by competing clubs show the following results:—

### Aero Science Club of America

	Best Flight			Total	Average
Rudolph Funk	1429	1096	50	2575	858
C. V. Obst	1866	1175	200	3241	1080
Egbert Lott	1231	680	10	1921	640
G. A. Cavanagh	50	(Wrecked)		50	
Club total				7784	2578
Club average					657

### Bay Ridge Model Aero Club

	Best Flight			Total	Average
T. H. Hodgman, Jr.	646	200	250	1196	398
William Heil	471	250	100	821	279
L. J. Bamberger	590	200	50	840	280
W. F. Bamberger	461	398	150	1009	336
Club total				3866	1293
Club average					323

### Harlem Model Aero Club

	Best Flight			Total	Average
Harry Schultz	1010	300	250	1560	520
Alfred K. Barker	1990	1790	250	4030	1343
J. Barker	1790	1414	1405	4609	1536
George Bauer	950	200	75	1225	408
Club total				11424	3807
Club average					951

### Detroit Aero Research and Model Club

	Best Flight			Total	Average
W. P. Dean	1145	964	255	2634	788
Maurice Guy	485	563	215	1263	421
Reginald Brewer	215	165	150	530	176
Henry Weber (Wrecked)				20	20
Club total				4447	1405
Club average					351

### Milwaukee Model Aero Club

	Best Flight			Total	Average
Lynn E. Davis	2382	1-3	1000	3482	1160
Gilbert Counsell	1478	(Wrecked)		1478	492
Irwin Eiring	930	225	155	1315	438
Kenneth Sedgwick	943	450	411	1804	601
Club total				8079	2691
Club average					672

### Pacific Northwest Model Aero Club

	Best Flight			Total	Average
Robert La Tour	2455	1822	1538	5815	1706
Lawrence Garrich	1321	1288	1054	3663	1221
Leon Dover	1413	807	677	2892	965
George Stoneham	1611	1583	1523	4717	1179
Club total				17092	5071
Club average					1267

### Texas Model Aero Club

	Best Flight			Total	Average
Dwight Brown	768	459	257	1483	494
Berkley Hunter	553	105	71	729	243
Henry Criscoli	1502	1478	1266	4246	1415
William McAlpin	39	29	23	91	30
Club total				2779	2182
Club average					545

### Long Island Model Aero Club

	Best Flight			Total	Average
Lester Ness	352	300	125	777	259
G. H. Criscuoli	360	284	151	792	264
Henry Criscuoli	1502	1478	1266	4246	1415
Club total				5815	1938
Club average					646

### Summit Model Aero Club

	Best Flight			Total	Average
Wallace A. Lauder	3537	2276	1880	7693	2564
Curtiss B. Myers	1990	122	25	2137	712
Carter Tiffany	1700	75	50	1825	608
Harry Herzog	1343	1099	1094	3536	1178
Club total				15091	5062
Club average					1265

The contest just closed was for distance. The September contest is for duration, starting from water, and is open to model flying boats and hydroaeroplanes, the flying boats to be allowed 20 per cent. in addition to the duration achieved.

### Aero Science Club of America

G. A. Cavanagh

In order that a favorable place may be found to hold the hydro contest in the National Model Aeroplane Competition, it was decided at the last meeting to hold the contest on September 26th. In the meantime the members are requested to look for a suitable place to hold the contest. This will also enable many of the members to give their machines satisfactory trials.

Mr. Lawrence J. Lesh, who was formerly with the Chanute and Glen H. Curtiss, gave a very interesting discussion on aeroplanes and wireless. He also talked about his experiments with gliders. All those who were present appreciated Mr. Lesh's discussion.

Messrs. McMahon and Schober flew their compressed air machines at Garden City on September 12th. Mr. McMahon's model exhibited good stability, but in so far as the propeller used was of rather high pitch the best that could be done was in the way of short jumps. Mr. Schober's model was exceptionally well made, with plenty of power behind a good motor, but he, too, experienced difficulty in the way of flexible wings which prevented the machine from getting off the ground. Both motors were well made and worked remarkably well, and as soon as the faults are adjusted no doubt good flights will be made.

For further particulars address the Secretary, 29 West 39th Street, New York City.





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

"Airmen Drop Bombs in Baden and Argonne." Here today, Argonne tomorrow.

#### A Detail

Enthusiastic Aviator (after long explanation of principle and workings of his biplane)—"Now, you understand it, don't you?"

Young Lady—"All but one thing."

Aviator—"And that is—?"

Young Lady—"What makes it stay up?"—*New York Times*.

#### Qualified

A German citizen who had won a prize in a lottery in the form of a ticket entitling him to a free ride on a Zeppelin was prevented by the sudden declaration of war last year from taking his ride. He took immediate advantage of the crisis, however, to apply for a removal from the Second Landsturm, to which he was normally assigned, to the airship corps.

"Have you," asked the recruiting officer, "any special equipment for service in this department?"

The volunteer solemnly handed over his lottery ticket.

"If you please," said he, "I am the possessor of this free pass to the air."—*New York Evening Post*.

#### A Strict Censor

Rural Constable—"Sketching the harbor is forbidden, sir."

Artist—"Oh, that's all right. I'm making a study of clouds."

Rural Constable (impressively)—"Ah, but supposin' your picture got into the hands of the enemy's aircraft department, see the use they could make of it!"—*Punch*.

We gather from the London despatches that if the Germans aren't careful they are likely to get the entire English people interested in the war with their Zeppelin raids.—*New York Evening Sun*.

#### The Only Disgruntled French Soldier

The following dispatch comes from somewhere in France:

I only saw one disgruntled man in the French Army. He was an aeroplanist with what I called an honest grouch. We had just arrived at the aero station when this flier appeared from the clouds. As his machine touched the ground he stood in his seat, took off his helmet and banged it angrily on the ground. His leather coat followed. Then he flung himself over the side and stamped about the field.

He was very young. As we approached him he was investigating a hole in his shoe heel, from which he extracted a shrapnel ball. He then fingered several holes in the wings of the aeroplane, gently breathing curses.

He was asked to explain his trouble. It appeared that he had been over the German lines with bombs. Just when he had picked out for destruction a nice place of military value the lever controlling the bombs refused to work, so he was forced to return with the bombs still under the seat of the machine. He pointed at them with loathing.

While returning he was chased by a German aeroplane. When it got within fifty yards he emptied his revolver at it and saw it careening earthward. He pulled out the weapon and extracted the empty shells, but again pointed to the bombs and refused to be comforted.



**FARM HAND.**—By gravy!  
The dangers uv aviation  
ain't been overstated.  
(Courtesy Scribner's Magazine.)



(Continued from page 15)

**Illinois Model Aero Club Notes**

By Joseph J. Lucas

Labor Day, September 6th, the boys were out tuning their hydros at Lake Calumet.

Those who, with hydros, were Messrs. Ellis C. Cook, Joseph J. Lucas, D. Lathrop, T. Hall, W. Wrixon, L. Hittle and W. Schweitzer.

Mr. Ellis C. Cook had out a very fine light hydro (Cook 42) and made three good flights, namely: 72, 99 and 98 seconds. Average 89 2-3 seconds.

Mr. Cook expects to make two minutes' duration in the hydro contest of National Model Aeroplane Competition. He also had out his last year's model hydro (Cook 36), and did 35 seconds. The reason for low duration was underpowered.

Mr. T. Hall had a twin-push hydro and made three flights, namely: 30, 30 and 37 seconds; average, 32 1-2 seconds.

A very good hydro which was made by Mr. Joseph J. Lucas was smashed while making a flight. Mr. Cook expects to be out by the end of the week in fine shape.

Mr. Wrixon had a single-push hydro and Mr. Schweitzer a twin-push but both had adjustment trouble.

Mr. Lathrop had out a very light single tractor, but the best flights he could get were only 14 and 16 seconds. Mr. Lathrop is the one who made the world's H. L. tractor record of over four (4) minutes.

Mr. Hittle's tractor hydro made eight seconds and showed good stability in flight Saturday, Sept. 11th, the elimination for land-launched duration to pick the ten for the return meet with Milwaukee.

Sunday, Sept. 12th, the hydro elimination of the National Model Competition at Lake Calumet will be staged. In these two elimination meets it is expected that over a dozen flyers will turn out with models.

**Buffalo Model Aero Club**

By Christian Weyand

The field meet of the B. M. A. C., held on Saturday afternoon, September 4, was very successful. The object of the meet was for the members to compete in a long distance H. L. contest, the winner to be entitled to an amount of model supplies offered by the club. Each member was to have three successive official flights, and an average was to determinate his standing. Although a perfect calm interfered with good long distance flying, some good work on the part of the members ensued. Arthur A. Agthe won the prize with a 42-inch model. His flights were as follows:

- 1—742 ft., duration 58 sec.
- 2— 75 ft.
- 3—735 ft., duration, 58 2-5 sec.

Av., 519½ ft.

Mr. J. W. Schreier's model met with an accident at the beginning of the meet, which interfered with expected results. Mr. Weyand had much trouble in persuading his 3-ft. model to fly straight, but at the end of the meet was rewarded with a series of very steady flights, with 805 ft. as the longest, breaking the former club record of 530 ft. Both Mr. Gellart and Mr. Schendel were on hand with some speed models, which traveled for good distances at an approximate speed of 21 miles per hour. On Saturday afternoon, September 18, if weather conditions permit, a H. L. duration contest among the club members will be held for a prize offered by the club, and some good models are expected to be flown.

The regular meeting was held Tuesday evening, September 7, at 48 Dodge street. A few new amendments and corrections were effected in the constitution, especially pertaining to contests. A few selected questions were read and answered by which means valuable information was imparted to members whose models do not satisfy. An innovation R. O. G. model is being developed by one of the members, and its construction with drawings will be published later. For club particulars, write J. W. Schreier, Secretary-Treasurer, 48 Dodge street.

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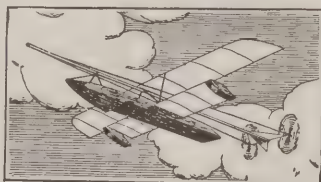
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(Continued from page 6)

Convention, held at Boston last August, shows the noble purposes and sympathetic appreciation of fundamental values. Mr. Wise Wood said:

"Gentlemen, I have come here through some of the most beautiful country that man ever has tilled and woman carpeted with flowers. There were fields of grain that beat like the waves of a golden sea against green islands of trees, hung with gems of fruit. There were winding roads of exquisite smoothness—swift ribbons of friendship which bind together in neighborly contentment the homes of the rich and the less rich, alike. There were factories throbbing with work. There were white churches, there were libraries, there were playgrounds. And, gentlemen, filling all these, there were people—men, women, children—happy, thoughtless and carefree. In all my journey I do not remember having seen a rough incident of life; not even a policeman to remind me that there still remains in the world the need for force. And I thought how good is civil life; how precious the freedom to go or to come; to work or to play; to think or to speak, as one's own soul dictates. And how sweet the security of life—the peace with which the mother sees her children go forth for the day, the confidence with which she awaits their return at evening.

"Then I thought of the beautiful plains of Belgium, as I had seen them last, of the children at play, and the women and men at work in their fancied security, and the gem-like houses in which the poor resided. Then the present came over me with horror; I wondered where are now the children, and the men and women I had seen, and what of the future of those who are left. Then I thought of the address which I had to prepare, of the horrid cause which had made it necessary, and of you, gentlemen, who wear the heavy robes of responsibility, and who are charged with the lives and happiness of those who have placed themselves in your keeping.

"I found myself wondering if some of us are not yet unaware of the full meaning of the change which has come over the world, of what it portends, and of the hideous possibilities for us which it contains. I wondered if some might not still be blinded by the few fragments which remain of our belief that all controversies may be settled without war, and if they know how thoroughly that belief, and our over-confidence in the integrity of the world has thrown our means of defense into decay, and left us open to the marauder.

"These things I say to you frankly, gentlemen, because I am fearful. I know how devoutly you wish that we be left at peace, to work out the huge, benign problems of a healthier existence, in the solution of which we are engaged. But I am fearful lest many of us should misjudge the means by which that peace may be secured, and thereby permit our very love for peace to imperil the preservation of it. I confess to being a hater of war, a passionate advocate of the maintenance of peace, but I realize that peace to be had must sometimes be fought for, that to be preserved it must be protected, and that to be protected it must be surrounded by impregnable barriers. In the names of those whom I represent I now ask for these barriers, and beg that with all the weight of your great office you will labor with us to surround our common country with such barriers, by sea and by land, as will place wholly beyond the possibility of enactment, upon your soil and mine, among your people and my own, the hideous scenes of carnage and rape, that have made the face of our clean and chivalrous American manhood hot with anger and shame."

I, too, like Mr. Wise Wood, have lived in Europe when it was at peace; I have hated the idea of war, and am striving with all my might to advance the movement which I heartily believe will result in preventing war. I am working for peaceful preparedness, and peaceful preparedness, Mr. Ford, is to the ill of war what prevention is to all other ills—the best cure, and you should promote it instead of opposing its development.

Very cordially yours,

(Signed)

HENRY WOODHOUSE,

Governor Aero Club of America, Member Conference Committee on National Preparedness.



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VOL. II

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No. 2

## Santos-Dumont Coming to United States to Head Pan-American Aeronautic Convention

**A**LBERT SANTOS-DUMONT, the Brazilian pioneer in aeronautics, who made the first public flight ever made with a dirigible balloon and with an aeroplane, has written to the Aero Club of America, accepting the club's invitation to come to the United States and head a Pan-American Aeronautic Committee, which is to take charge of a movement to develop aeronautics in South and Central America.

The Aero Club of America wrote to Santos-Dumont, pointing out that the gift of wings, symbolizing the achievements of dynamic flight, is a gift of the New World to the Old, just as the gift of civilization, through the discovery of America by Columbus, is regarded as a gift of the Old World to the New, and that his, Santos-Dumont's, achievements in 1900-06, when he demonstrated the possibilities of conquering the air with the dirigible balloon as well as with the aeroplane, when combined with the achievements of the Wright Brothers, Langley and Curtiss, makes the gift of wings by the New World to the Old most complete.

It was pointed out in the letter that the aircraft is to be a powerful instrument of civilization and of peace—and that the adoption of aircraft as vehicles of general transportation will solve the difficult problems of transportation, which limit the development of the resources of South and Central America.

Santos-Dumont, replying from Madrid, Spain, where he had gone to escape the horrors of war (he being a peace lover), wrote expressing entire approval and satisfaction concerning this conception, and thanking the Aero Club of America for asking him to lead this movement, and saying that he expects to come in the latter part of September or early part of October.

Some of the aeroplanes like the "America" type flying boat, which are being used in numbers by the British, Russian and Italian Navies as air-cruisers; and the "Canada" type air-cruisers, a land aeroplane which carries a ton of useful load at a speed of 95 miles per hour, would make efficient vehicles for general transportation in South and Central America.

"Aerial transportation will, in a very short time, revolutionize the sociology and economics of South and Central American countries, where at the present time things are practically at a standstill because of lack of fast transportation and intercommunication," states Mr. Henry Woodhouse, a Governor of the Aero Club of America, in a report made by him to the club, regarding the work that might be undertaken by a Pan-American Aeronautical Committee.

"The South and Central American countries," continues Mr. Woodhouse's report, "may be said to actually need aeroplanes and dirigibles to solve their prob-

lems of transportation. In most of those countries railroad transportation is limited to the central places, and the process of transportation outside of central places is slow and costly on account of long detours made necessary by mountains, waterways and undeveloped country. The aircraft going, as it does, over all obstacles, at a high speed, would solve many problems of transportation.

"To establish air lines in South and Central America would take only a fraction of the time required to build roads and railroads to develop other forms of transportation, and the cost of such a system of transportation would likewise be only a fraction of what it would cost to establish other systems of transportation. In the worst possible conditions it would require nothing more than a clear field for a landing place for the aeroplanes every fifty miles.

"With the stabilizers and scientific instruments and enclosed cabins, which enable aviators to navigate the air scientifically and to be protected from the elements at all times, the establishment of air lines for commercial purposes is quite possible at the present time.

"Little has as yet been done in those countries to utilize aircraft; there has, in fact, been little done to develop aeronautics on a practical basis. But Latin-American aviators have shown rare adaptability in their profession. They—prominently Santos-Dumont first, then Chavez, Bielovucci, Fels, Montero, Rapini, Figueroa, Newberry and a dozen others—accomplished remarkable feats; Santos-Dumont made the first public aeroplane flight ever made; Chavez and Bielovucci, by flying over the Alps, led the way to the conquest of mountains which has since been made so thorough that there is hardly a high mountain in Europe that has not been flown over.

"That aeroplanes and dirigible balloons can be used in those countries there is no doubt. Aeroplanes have now shown conclusively their practicability for application for commercial purposes. That has been demonstrated by thousands of flights—flights of from three to eight hours' duration; flights of from 500 to 1,000 miles in a day across countries; flights at a speed of between 70 and 90 miles an hour; flights of from 8,000 to 15,000 feet; and flights across mountains and large bodies of water.

"The aviation records are: Speed, 140 miles in an hour; endurance, 24 hours, 12 minutes without stopping; altitude, 26,246 feet; distance covered in one day, 1,300 miles; weight carrying, ten passengers on a six hours' flight, and on many flights sixteen passengers. The French authorities have been using aeroplanes very generally in Africa, in the Sahara desert, with success.

"These are all European records, but the reason that few records are made in America is not that we lack



efficient machines, but rather that there has been no inducement for aviators to make records, and the big constructors that we have are so busy filling orders that they have no need or time to make their aviators engage in making records.

"Since the war started, American aeroplane constructors have, in fact, been supplying hundreds of aeroplanes and aeronautical motors to the warring nations, and this large demand for aircraft for warfare will itself be instrumental in developing efficient aircraft for transportation. The military authorities' increasingly severe requirements for military aircraft have caused an incredibly swift progress, and have brought about the development of efficient, weight-carrying aircraft that can compete with the swiftest transportation of any other system, and can compete economically in places where transportation is slow and difficult.

"When these things come to pass there will be a most peaceful social revolution. Swift transportation and the elimination of frontiers will rapidly mix people and their interests, and from that will evolve international civilization, and the world will become a world-nation. The records mentioned above have all been made within the past few years. The dirigible balloons have records much more substantial. The big Zeppelins have each a carrying capacity of between four and five tons; the passenger carrying accommodate thirty passengers affording every convenience afforded by a Pullman car; and they travel at forty-five miles an hour, and can cruise for as long as forty hours without stopping. The records of the smaller non-rigid type are almost as substantial.

"What problems of transportation these aircraft can solve and what progressive developments can be worked out in countries where railroads are limited may be imagined. So far very little has been done in that line. Most of the above mentioned countries have seen but few aeroplanes and no dirigibles. True, Brazil, Argentine and Chili are planning to spend \$2,000,000 on military aeronautics, and Mexico has required a score of aeroplanes, but no thought has been given to applying the aircraft to solve problems of transportation. The aeroplanes acquired by those countries so far have been of the light scouting type, which are not suitable for weight carrying.

"Aerial transportation will mean rapid transit with utter elimination of frontiers and the intermixing of people and their interests. That means unification, peace and prosperity."

### Maine the First State to Actually Take Steps Toward Founding a System of Aerial Coast Protection

**F**OLLOWING close upon the offer of Rear Admiral Robert E. Peary to give to the Aero Club of America the use of Flag Island, near Portland, Me., for the establishment of one of the aerial coast defense stations, a meeting was held on Sept. 13 in the office of Mayor William M. Ingraham in the City Hall, Portland, Me., at which the first steps were taken for the actual establishment of the first station.

Many prominent business men attended the conference and listened with marked attention to the plan as presented by Admiral Peary. He announced that he had notified the Aero Club that Flag Island could be used as an aerial station and that Henry A. Wise Wood, of New York, vice-president of the Aero Club, and a member of the new Naval Advisory Board, had gone to

Flag Island in his yacht and had spent a day in making a survey of the situation and had found the island to be not only suitable for the purposes indicated but to be a spot of strategic importance.

Admiral Peary further announced that if a public meeting, dinner, or conference were held in the furtherance of this feature of preparedness Mr. Wood, who is also chairman of the Conference Committee on National Preparedness, and is President of the Association of Aeronautic Engineers; and John Hays Hammond, Jr., the radio expert, would attend and lend their aid to the movement.

The proposed Aero Station would involve an expense of about \$10,000, and would include an equipment of one aeroplane, one hangar, two aeronauts, two mechanics and complete equipment for one year.

This aerial station would give to the important defenses of Portland and the Kennebec River the protection which they are now in need of according to the new system of warfare. The establishment of an aerial station at Flag Island would probably be the forerunner to the establishment of a submarine base in that vicinity also.

The *Portland Evening Express* says editorially of the proposition:

"We can see many advantages and no disadvantages in making Portland a headquarters for the aerial coast guard as per the plan advanced by Rear Admiral Peary and approved by Henry A. Wise Wood, vice-president of the Aero Club of America. There appears to be a great deal of real merit and common sense in the proposition. Casco Bay is undoubtedly the logical place for an aeronautic station and Flag Island seems to fill the bill perfectly according to the report made by Mr. Wood. The proposition as we understand it does not call for any prohibitive outlay and it should not be difficult to raise the sum required to establish and maintain the station. There is also every reason to believe that once the practicability of such an aerial coast guard is demonstrated the Government will take a keen interest in the movement."

To Maine, therefore, goes the honor of being the first state in the union to actually take steps toward founding a system of aerial coast defense, and all honor is due to the men whose foresight and patriotism have prompted them to take the initiative. That their plans will be carried to fruition, and that the public-spirited men of the state will readily subscribe the amount necessary to make the proposition a reality is a foregone conclusion. Aerial coast defense stations are not sentimental things but necessities and in furnishing the means for the establishment of the first of the coastal system the men of Maine will be taking a logical step in the preservation of peace and the protection of their homes and families. But the men of Maine can serve their country even more perhaps than they are now aware of. If they handle this proposition with the vigor, determination and intelligence that it is worthy of, they will give a further impetus to the movement in other states. For, if it is seen that the project in Maine has been pushed through with promptitude and success, the citizens of other communities will take up similar duties with better zeal and better faith than they otherwise would.

The work is necessary. Portland is a fitting place. The beginning is auspicious and it is hoped and expected that the splendid example of Maine will be quickly followed by other communities along our extended coast line, both east and west.





# THE NEWS

## Lieut. John C. Porte's Secret Visit

One of the editors of AERIAL AGE some time ago met Lieut. John C. Porte in the Biltmore Hotel and saluted him as one does a friend who has been absent a long time.

"Ssh!" said the Lieutenant in a subdued tone, "I am Mr. Scott, just now."

For strategic reasons Lieut. Porte was travelling incognito and for other reasons that need no explaining he desired the editor to make no publication of his presence in the country. Of course, his wishes were honored, but now that the Lieutenant has safely recrossed the Atlantic the reason for silence has been removed and so those who knew of his visit were released from their pledges not to proclaim the news that the enemies of Great Britain might profit thereby.

It will be recalled that Lieut. Porte was busy preparing the "America" for a flight across the Atlantic when the war broke out. Then the flight was indefinitely postponed and he returned home for the more serious business of defending his country. Lieut. Porte is now Squadron Commander, in charge of the Royal Aviation Depot at Hendon, England.

Lieut. (or Commander) Porte arrived here on the Cunard steamer Tuscania on Aug. 21, accompanied by W. A. Casson, a prominent barrister of London. The former made his headquarters at the New York Club, visited the Curtiss plants at Hammondsport, Buffalo and Toronto, spent two days at Atlantic City, transacted business in various places in New York City and sailed for home again on the Adriatic. He was very anxious to keep his homeward sailing a secret until the Adriatic had docked, because it was thought that the Germans would make an extra effort to get the ship if they knew that he was aboard.

One object of Mr. Porte's visit to Toronto was to test the giant aeroplane "Canada," almost a duplicate of the America, which had just been finished for the British Government. Lieut. Porte found this to be satisfactory and accepted it in behalf of his Government. It is claimed that the Canada is bigger and faster than the German "Aviatik" aeroplanes. Its wings are 75 feet over all and with a load of 2,000 pounds it can attain a speed of 95 miles an hour. Hitherto it has been necessary for an aviator to ascend above his enemy before he could deliver a death blow, but with the Canada all that is changed because the carriage projects six feet beyond the wings in both front and rear. Rapid-fire guns, mounted fore and aft, can from this craft sweep the whole heavens, above and below. The Canada will have two propellers, each driven by a 160-horsepower motor. Lieut. Porte says that the aeroplanes of the Canada type can carry 2,000 pounds of explosives in the shape of bombs weighing from 25 to 200 pounds, the latter so powerful that one can utterly destroy a battleship. The bombs will be dropped by a new device developed by Messrs. Sperry, which will be used for the first time on this ship.

Lieut. Porte is still enthusiastic over the trans-Atlantic flight, and he says that when the war is over he intends to come back and make the trip as originally planned.

## New York State's Aero Detachment

Governor Whitman is keenly interested in the development in aviation and foresees the necessity of an aviation corps as a part of the National Guard of the State of New York. He

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## First Dirigible Ready for

The Connecticut Aircraft Co., which has a contract for building dirigibles for the government, has notified the Office of Aeronautics of the Navy Department that the first of the balloons has been completed and will soon be assembled for its official trial at Pensacola, Fla. The Navy Department is building a floating hangar and a hydrogen plant at Pensacola for the accommodation of its dirigibles.

The first balloon has many improved features, which for reasons that need no explaining, are kept secret. It is comparatively small, having a length of only 180 feet. Power is furnished by a 160-horsepower motor, with twin propellers of the swivelling type. The dirigible was first assembled in Boston, and then taken apart for shipment to Pensacola, where it was reassembled.

## Output of Curtiss Motors

The increase of business at the Curtiss factories, instead of brushing aside experimental work, has on the other hand, enabled the company to increase its experimental work. The new "XV" Curtiss Motor is the direct result of this experimental work, a motor in which the power has been raised to 170 net brake horsepower, while the weight has been reduced to 575 pounds. At the original Curtiss motor factory, in Hammondsport, they are turning out seven "O X" and "O X X" 90-100 horsepower engines per day. The Buffalo factory is turning out ten complete motors of the new model type—"XV"—per day, and of course the Curtiss Aeroplane Co. has the first call on all of these motors.

The Model TA Martin Seaplane. Twenty machines of this type have been ordered by the Netherlands. They are equipped with the Hall-Scott 125 h.p. engines.





#### Patent on Hydroaeroplane to Glenn H. Curtiss

An important decision has just been rendered by the Commissioner of Patents vesting the rights of discovery in the hydroaeroplane to Mr. Curtiss. The decision is announced the following communication from the Curtiss Company:

'Glenn H. Curtiss, head of the Curtiss Aeroplane Co. of Buffalo, has just been granted the patent claim to the hydroaeroplane by Commissioner of Patents Ewing at Washington. This removes all doubt as to Mr. Curtiss's complete title to the invention and gives him officially that full credit and title which the world has long since accorded him as originator, builder, operator and manufacturer of the hydroaeroplane.

"The rendering of this decision completes a chain of claims in the hydroaeroplane and flying boats, giving Mr. Curtiss complete control of the commercial hydroaeroplane and flying boat business, which he has built up in this country and abroad. Several patents have hitherto been granted to Mr. Curtiss on hydroaeroplanes and flying boats, one of the most important of which was patented last June and covers practically all flying machines of the now well-known flying boat type.

"The Curtiss types of water flying machines are acknowledged to be far superior to the type attempted in the early days. They have proven themselves to possess seaworthiness to the highest degree, to be capable of the highest speeds on water and in the air, to possess the maximum ease of control and to be of unlimited adaptability."

The flying boat is acknowledged the world over to be the sportsman's vehicle of the future, as well as the type of larger weight and passenger carrying of the present and future. The "America," in which Lieutenant Porte expected to cross the ocean last year, was of this type.

Ever since the commercial development of these types by Mr. Curtiss and his company several years ago, they have been widely used on both inland and ocean waters by the navies of the principal countries of the world, among them Russia, Austria, Italy, Great Britain and the United States.

#### American Graduates in England

The Royal Aero Club of the United Kingdom recently announced the granting of aviators' certificates to sixty candidates. Thirteen of this number are graduates of the Curtiss School at Toronto, Canada. The Canadian graduates and the dates of their certificates are as follows:

H. S. Ince, July 11th, 1915; F. Homer Smith, July 11th, 1915; D. A. Hay, July 12th, 1915; Grant A. Gooderham, July 12th, 1915; Cornelius Innes Van Nostrand, July 12th, 1915; Douglas Grahame Joy, July 20th, 1915; Claire MacLaurin, July 20th, 1915; Eric Harrington McLachlin, July 20th, 1915; Charles Norman Geale, July 20th, 1915; Warner Hutchins Peberdy, July 20th, 1915; A. T. Cowley, July 30th, 1915; A. J. Nightingale, July 30th, 1915; R. D. Delemere, July 30th, 1915.

The list of American certificates included in the same announcement is as follows:—

Hydro-aeroplane.—Hugh A. Peck (Thomas Hydro-aeroplane, Ithaca, New York). July 21st, 1915.

Hydro-aeroplane.—Frank S. McGill (Thomas Hydro-aeroplane, Ithaca, New York). July 21st, 1915.

J. Morrow Alexander (Wright Biplane, Wright School).

#### "Weather"

The subject of "weather" is one of vast importance to the aviator, and at least a general knowledge of its presage and phenomena, and the instruments for indicating the same, is an essential part of his equipment. The Taylor Instrument Company, of Rochester, N. Y., have published, in most convenient form, a small volume under the title "Weather and Weather Instruments for the Amateur," which supplies in non-technical form all the information which the aviator requires. The first chapter describes the use of the aneroid barometer, and subsequent chapters offer keys to the use of weather maps, altitude barometers, the vernier, stormographs, thermographs, calibrating apparatus, the hygrometer and the hygrodeite. There is an entire chapter given over to the study of compasses, and it contains information which every pilot should be possessed of. We cordially recommend this little volume to everyone interested in the navigation of the air.



Mr. H. K. Chow on the left, who is working for the Curtiss Company, and Major-General Liu Tsching-En of the Chinese Army and Directors of the Hanyang Arsenal at Hupeh, China, with Raymund V. Morris, Curtiss pilot. The photograph was taken during General Liu's visit to the Curtiss factory at Buffalo.



### Night Flight in a Goodyear

An unusual example of the ability with which a spherical balloon may be guided by taking advantage of air currents was given by R. H. Upson, who piloted a Goodyear balloon from Indianapolis, Ind., to Akron, steering by the stars.

The ascension was made at 3 P. M. on Labor Day during a great military tournament held in the big motordome of the Hoosier Capital. The Goodyear went up as a war balloon in connection with a sham battle staged on a large scale and Pilot Epton carried Lieut. Commander McCrary and Lieut. Maxfield as passengers. Not being dirigible in the ordinary sense, the aeronauts had to take advantage of favorable air currents to carry them in the desired direction—Akron. Two main currents were located, one moving north and the other moving in an easterly direction. It was decided to make use of these currents to reach the home city. The winds were strong and steady and the aerial voyagers followed along in the cool zone to the rear of a storm belt. They were well on their homeward journey before the sun sank out of sight, the landscape faded into darkness and the lights of cities and villages twinkled below. High speed was made throughout the night at an altitude from 1,000 to 2,000 feet. They guided their course by the stars. When dawn revealed the landscape they discerned the town of Mansfield, the sight of which confirmed their calculations. Soon after they came within sight of Akron, floated directly over the city and landed in a field at Silver Lake—"the first time in the annals of Goodyear ballooning the great gas bag brought itself home." The landing was made at 5:30 Tuesday morning, the 280 miles having been made at an average of 20 miles an hour.

### Aviation Day at the Michigan Fair

The Michigan State Fair has had a record attendance this year, but the interest in everything else was eclipsed by the events of Aviation Day when Miss Katherin Steinson, the eighteen-year-old aviatrix, was billed to thrill the crowd with startling stunts. O. E. William and Aviator Bosdek furnished the aerial feature of a sham battle, staged by the Michigan National Guard.

### E. D. Brewer in the Movies

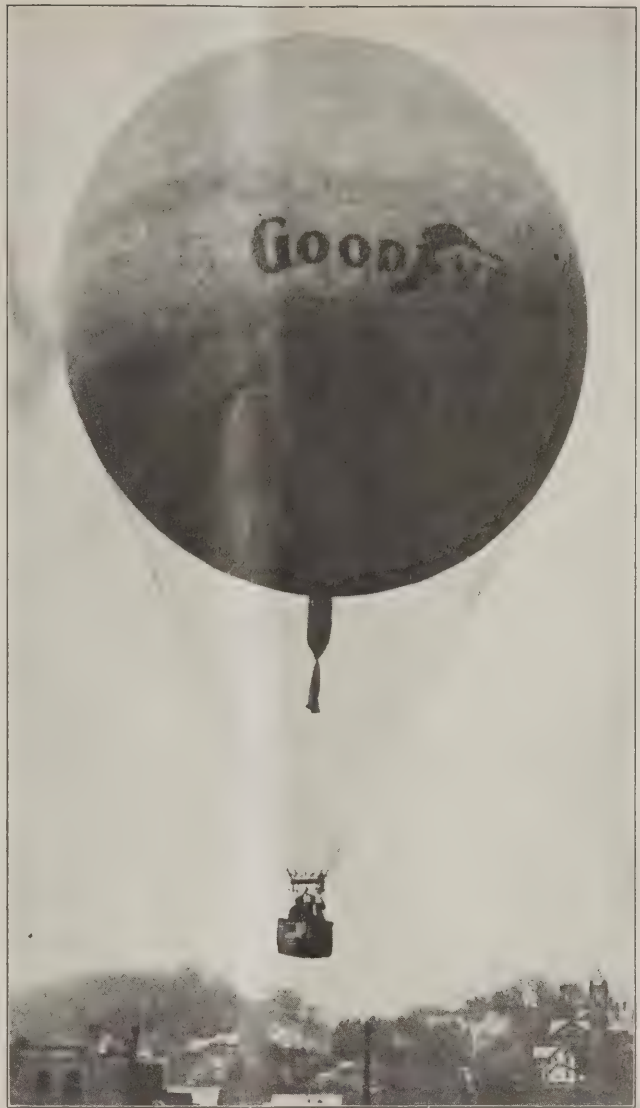
E. D. Brewer, who built and flew the first Nashville, Tenn., aeroplane, is to be the central figure in a new moving picture play that is to be produced in Nashville.

### Tampa, Fla., Is Pulling Wires

The Tampa, Fla., Real Estate Board see the advantages that will accrue to any city that is fortunate enough to get an aeroplane station of any kind located within or near its boundaries. It has asked that Tampa be given consideration as a site for a proposed aviation school. An officer is to be sent there from the War Department to make a report.

### Crewdson's Flights in the Middle West

Harry Crewdson, of Chicago, who is making exhibition flights in the Middle West, recently added a thrill that was not on the program of the Ironton, Ohio, Apple Show. On September 17 he made an ascension in the face of a breaking storm, rather than disappoint a crowd which had assembled to witness the spectacle, but when his machine had risen above the protection of a hill that had broken the force of the wind, he was immediately put into a perilous position. The wind suddenly became so strong that his engine was unable to drive the plane against it. The drenching rain poured in and the engine went dead. The aeroplane turned over on its side, described a semi-circle, and Crewdson volplaned his way back to the alighting place. "It was the most dangerous flight I ever made," he said after escaping from the teeth of the gale.



The Goodyear Balloon piloted by Mr. R. H. Upson from Indianapolis to Akron.

After an extended stay in Italy Albert A. Heinrich, the aviator, accompanied by his wife, has returned to this country. Mr. Heinrich has made a large number of flights during the summer.

Charles F. Willard, the veteran aviator, who is with the Curtiss Co., was a visitor at the Aero Club of America last week.

Glenn L. Martin, the head of the Glenn L. Martin Co., of Los Angeles, California, is at present in New York engaged in negotiations with various purchasers.

D. C. Scott, of the Hall-Scott Motor Car Co., San Francisco, has been in New York for the past two weeks.

The Maximotored Verville-Perry tractor, constructed by A. V. Verville at Detroit, Michigan.





## PENSACOLA AERONAUTIC STATION NEWS

The U. S. S. North Carolina, which has been designated by the Navy Department as the U. S. Navy Aeronautic Ship, arrived at the aeronautic station on Thursday, September 9th, and was received at sea by aeroplanes from the station, which convoyed her to an anchorage in the bay. As soon as the big vessel let go her anchor all aeroplanes returned to their hangars. This unique convoy of the man-of-warman by aeroplanes several thousand feet up in the air executing graceful turns, steep dives and spirals, lent quite a warlike appearance to the occasion, and stimulated the imagination to picture foreign troop ships of the present day steaming through the enemy's war zone under aeroplane convoy.

The North Carolina is equipped with two aeroplane hoisting cranes, one of which was designed by the Navy Department and the other by the Aeronautic Station. Extensive experiments will be started at once in order to determine the most practicable methods of hoisting aeroplanes aboard ship upon their return from over-sea scouting flights. The catapult, or aeroplane launching device, which has been successfully operated, will be removed from its present location on a coal barge from which the experiments were made, and installed on board the North Carolina, after which launching and hoisting tests will be made on the open sea under conditions simulating those of actual battle.

The old yard administration building is being converted into quarters for bachelor officers performing duty at the Aeronautic Station and will be ready for occupancy on or about October 1st. The entire building has been remodeled and renovated and due to its delightful exposure will be model quarters for eight or ten bachelor officers. The old yard dispensary, directly across from the administration building, is also being remodeled and converted into a library and mess for use of the bachelor officers quartered in the yard. Its old-fashioned style of architecture, with wide verandas and screened in porches, makes it particularly well adapted for the purpose for which it will be used.

Several exhibition flights were made on Labor Day at the request of the Mayor of Pensacola, for the benefit of the Knights of Labor, encamped for the day at Palmetto Beach. Lieut. E. L. McDonnell, U. S. N., in a Curtiss Flying Boat, Lieut. W. Capehart, U. S. N., in a standard Curtiss Hydroaeroplane, and Lieut. G. D. Murray, U. S. N., in a standard Curtiss Hydroaeroplane, did the flying, which was entirely successful and was appreciated by the numerous spectators on the beach.

Lieut. P. N. L. Bellinger has been designated as official observer by the Aero Club of America to witness the flying of Lieut. H. T. Bartlett, U. S. N., in his prescribed tests for the Aero Club's license.

Weather conditions during the past week have not been as good as might be expected for this time of the year, as unusual air disturbances were caused by the proximity of the tropical hurricane, which swept inland over Appalachicola and Quincy, Fla. During the interims between the intermittent high winds, 28 hours and 12 mins. of actual flying was accomplished, which gives approximately 1,636.5 miles of flying throughout the week.

The Commandant has received the following letter:

"Washington, D. C., Sept. 4, 1915.

"To the Commandant,

"U. S. Navy Aeronautic Station,

"Pensacola, Fla.

"SIR:

"I wish to express my appreciation of the promptness and thoroughness with which aeroplane AH-10 was prepared and dispatched for use during the experimental mortar flying at Fort Monroe, Virginia, and of the good work of Lieutenant Bellinger and the detachment under his command while on this duty.

"Respectfully,

"JOSEPHUS DANIELS,  
"Secretary of the Navy."

Lieut. (j. g.) E. O. McDonnell, U. S., has completed the flying tests prescribed by the Aero Club of America preparatory to being licensed by that organization as a qualified hydroaeroplane pilot. The flying was done in a standard Curtiss hydro and was witnessed by Lieut. P. N. L. Bellinger, U. S. N., who is the Aero Club's official observer.

A new organization of officers attached to the Aeronautic Station which provides that they shall perform duty, in addition to that of flying, has been promulgated and became effective on September 1, 1915. Owing to the fact that the

Aeronautic Station consists of a Navy Yard and a Naval Reservation, containing two villages, the civilian population of which totals 1,069 people, and the fact that the Navy Yard is the equal in size and equipment of many of the large Navy Yards which are being maintained in full commission throughout the country, it has been found necessary to assign officers who have been detailed to aeronautic work to perform administrative and executive duty in the upkeep and proper maintenance of the Station in general. These duties are performed as secondary to the aeronautical work, and at such times as flying is impossible, due to unfavorable weather conditions, motor troubles, etc. As previous experience in Navy Yard administration is essential before assuming command of a Navy Yard or shore station, this duty at the Aeronautic Station is invaluable for the young officers attached thereto in training them to future commands of shore stations.

If aeronautic bases are to be established in the future throughout the country, they will undoubtedly be organized and operated upon the same lines as those in force at the present time at the Aeronautic Station, and as it is more than likely that such bases will be commanded by officers now serving at Pensacola, it is evident that the experience these officers are now getting and the practical knowledge which they are receiving in the care and maintenance of an aviation base will enable them to command such bases with efficiency and thorough familiarity of the nature of the work required from them. That aeronautic duty in the Navy is one of the most strenuous assignments to which a Naval Officer can be detailed is evidenced by the fact that in addition to perfecting themselves in the difficult and skillful duties in flying, they at the same time perform administrative and executive duties in the upkeep and management of a large Navy Yard and Naval Reservation.

The complete organization is as follows: Lieutenant Commander H. C. Mustin, U. S. N., Naval Aviator and Commandant of the U. S. Navy Aeronautic Station and U. S. Naval Reservation; Lieutenant K. Whiting, U. S. N., Naval Aviator and Captain of the Yard; Lieutenant J. H. Towers, U. S. N., on duty, London, Eng., Asst. Naval Attache; Lieutenant A. C. Read, Student Naval Aviator; Lieutenant E. F. Johnson, Student Naval Aviator; Lieutenant L. H. Maxfield, U. S. N., on duty Akron, Ohio, Goodyear Tire & Rubber Co.; Lieutenant (j. g.) P. N. L. Bellinger, Naval Aviator in Charge Erecting and Test Division; Lieut. (j. g.) R. C. Saufley, Naval Aviator, in Charge Flying School; Lieutenant (j. g.) V. D. Herberster, Naval Aviator, duty Berlin, Germany, Asst. Naval Attache; Lieutenant (j. g.) P. R. Paunack, Student Naval Aviator; Lieut. (j. g.) F. G. Haas, Student Naval Aviator; Lieut. (j. g.) C. K. Bronson, Naval Aviator, Asst. to Officer in Charge Erecting and Test Division; Lieut. (j. g.) W. Capehart, Naval Aviator, Planning Superintendent; Lieut. (j. g.) W. M. Corry, Student Naval Aviator; Lieut. (j. g.) J. E. Norfleet, U. S. N., Student Naval Aviator; Lieut. (j. g.) G. de C. Chevalier, U. S. N., Naval Aviator; Inspection Duty, Marblehead, Mass.; Lieut. (j. g.) W. A. Edwards, U. S. N., Student Naval Aviator and Asst. to Captain of Yard; Lieut. (j. g.) E. W. Spencer, Jr., U. S. N., Student Naval Aviator, and Asst. to Officer in Charge Erecting and Test Division; Lieut. (j. g.) G. D. Murray, U. S. N., Student Naval Aviator and Asst. to Officer in Charge, Erecting and Test Division; Lieut. (j. g.) H. T. Bartlett, U. S. N., Student Naval Aviator and Asst. to Officer in Charge Motor Erecting Shop; Lieut. (j. g.) E. O. McDonnell, U. S. N., Student Naval Aviator, and Asst. to Planning Superintendent; Lieut. (j. g.) H. W. Scofield, Student Naval Aviator; 1st Lieut. A. A. Cunningham, U. S. M. C., Student Naval Aviator and in Charge Motor Erecting Shop; 1st Lieut. B. L. Smith, U. S. M. C., duty, Paris, France, Asst. Naval Attache; 1st Lieut. F. T. Evans, U. S. M. C., in Charge Barracks, Bldg. 45; 2nd Lieut. W. M. McIlvain, U. S. M. C., Naval Aviator on Inspection Duty, Hammondsport, N. Y.

### McGee Engaged for Exhibition Flights

Jack McGee, of Pawtucket, R. I., has been engaged to give four exhibition flights at the Greenfield, Mass., Fair, September 28 and 29. Each flight will be of about ten minutes' duration and the management of the fair announces that Mr. McGee's program will include such fancy stunts as loop-the-loop, the dip of death and the aerial turkey trot. On one of his flights he will take a passenger up. Mr. McGee flies a Curtiss aeroplane. He is a graduate of the Hammondsport factory.



# THE EFFICIENCY OF AEROPLANES

By W. R. D. SHAW

FROM time to time various formulæ for the efficiency of aeroplanes have been proposed, but as no standard has yet been generally adopted, the writer ventures to submit the present article.

At least two formulæ are desirable for the efficiency of an aeroplane and may mean two things—viz.:

(1) Aerodynamic efficiency, the efficiency of the machine as an aerodynamic design.

(2) Commercial efficiency, the efficiency of the machine as a means of horizontal transport.

The first formula will be of value to the designer and engineer in the comparison of various aeroplane designs, while the second will interest the business man who wishes to know the cheapest method of delivering certain goods at a certain place in a certain time.

As the fundamental object of an aeroplane is the combination of support and transport, the following definition is reasonable:

The aerodynamic efficiency of an aeroplane is that percentage of the power developed that is manifest as work done in both the horizontal and vertical planes on the entire mass.

The following is suggested as the definition of the commercial efficiency of an aeroplane:

The commercial efficiency of an aeroplane is that percentage of the power developed that is manifest as work done in the horizontal plane on the useful load transported.

The above definitions form an excellent basis of design. It is clear that good aerodynamic efficiency is congruent with a high lift/drift value. Also, it follows that a commercially efficient aeroplane may be obtained by increasing the strength/weight values of an aerodynamically efficient machine, the useful-load/total-load value being thereby increased.

The designer is naturally mostly concerned with the efficiency of his share of the complete work. Hence, it behooves him to ascertain the percentage efficiency of his engine and propeller in order that this value may be embodied in the formula. Thus, the formula will give the efficiency of the complete machine minus the engine and propeller.

In order to evolve the designer's formula it is necessary to have actual values of the following factors:

(1) Total Load.—This is most satisfactorily obtained by actually weighing the complete apparatus.

(2) Velocity in Air.—The velocity of the machine relative to the air may be obtained by employing any reliable form of air-speed indicator.

(3) Thrust.—The following means of measuring while in actual flight the thrust of a propeller has been successfully employed at the Royal Aircraft factory. The propeller is mounted on a sliding sleeve fitted with a stiff spring so arranged that it can move forward a little in proportion to the thrust exerted, thereby communicating the pull through a suitable medium to a recording instrument.

(4) Horsepower.—The horsepower expended may be read from a chart showing the horsepower corresponding to various revolutions per minute of the engine. Thus, only a revolution indicator will be required.

(5) The Percentage Efficiency of the Propelling Plant.—The makers of the propeller should provide a chart showing the percentage efficiency of their product at various revolutions per minute. The efficiency of any gear intermediate between engine and propeller should also be ascertained.

\* In point of actual fact, the power plant of an aeroplane is utilized solely for support. From its very nature an aeroplane transports itself in the horizontal plane; in other words, its velocity is one of its inherent properties. This elementary truth, only too often lost sight of, is capable of illustration in many different ways.—Ed.

It will be seen that all the above factors are practically determinable and that nothing of a doubtful theoretical nature is involved. Having derived a formula from the above factors, it should be possible to put an aeroplane through tests at various speeds and then obtain a graph showing the efficiency of the machine at these speeds. In all such considerations as these stability is of course a *sine quâ non*.

Consider an aeroplane possessing the following factors:

Total flying load =  $W$  lbs.; velocity =  $V$  ft./sec.; thrust =  $T$  lbs.; power =  $P$  h.p.; efficiency of propeller, etc. =  $\epsilon$  %.

Since the mass is  $W$  lbs. and the thrust  $T$  lbs., while in horizontal flight the machine will have a virtual gliding angle of  $1$  in  $W/T$ .

Since the velocity is  $V$  ft./sec. it follows that in one second  $W$  lbs. are virtually raised a vertical distance of  $TV/W$  ft.

It follows then that the rate of doing work against gravity is  $TV$  ft. lbs. per second, which represents  $TV/550$  h.p.

In one second  $W$  lbs. move horizontally  $V$  ft. Therefore in one second  $VW/g$  ft./lbs. of work are done horizontally.

Therefore the total rate of doing work is  $TV + VW/g$  ft. lbs. per second, which may be expressed as

$$\frac{V}{550} \left( \frac{W}{g} + T \right) \text{ h. p.}$$

But the power actually developed is  $P$  h.p., and, as the % efficiency of the power plant and propeller is — it follows that the power transmitted to the machine is really

$$\frac{P\epsilon}{100} \text{ h.p.}$$

The percentage aerodynamic efficiency of the aeroplane minus the engine and propeller is therefore given by the formula

$$E = \frac{\frac{V}{550} \left( \frac{W}{g} + T \right)}{\frac{P\epsilon}{100}} \times 100$$

which reduces to

$$E = \frac{200 V}{11 P\epsilon} \left( \frac{W}{g} + T \right)$$

The above formula is particularly original in that it is practical. Recalling our text books, we remember that  $P$  is proportional to  $V^3$ . From the above formula we see then that aerodynamic efficiency is inversely proportional to  $V^2$ .

Let the goods to be transported weigh  $w$  lbs. The velocity being  $V$  ft./sec., the horsepower manifest in horizontal transport is  $wV/550$  g. But the actual expenditure is  $P$  h.p., of which  $\epsilon/100$ ths are transmitted to the machine. The percentage commercial efficiency of the aeroplane minus the propelling plant is therefore given by the formula:

$$E' = \frac{\frac{wV}{550}}{\frac{P\epsilon}{100}} \times 100$$

which reduces to

$$E' = \frac{100 wV}{11 P\epsilon}$$

A very simple commercial formula which can be applied to any means of locomotion is

$$e = \frac{1 \times v}{c}$$

where  $1$  = useful load transported (lbs.),  
 $v$  = velocity (m.p.h.),  
 $c$  = cost per mile.

It is often suggested that aeroplanes as a means of transport of goods can never be a commercial proposition, because power is expended in support as well as transport.\* There are many factors which all go to increase the commercial efficiency of any aeroplane. For instance, the very fact that an aeroplane can travel in straight lines over sea or land is in its favor, while a following wind may be utilized. No, it is not yet time to condemn the aeroplane as a means of transport, but to know just how we are progressing we must make wide use of some formula, suggestions for which the writer has offered above.





## LEARNING TO FLY AT THE THOMAS SCHOOL

By H. A. SOMERVILLE

"Get on your duster and we will see what we can do." This is in all probability is the manner in which you will receive your invitation to mount an aeroplane and start for the first time your exploration of that element which for so many centuries remained a sealed book to man.

Your brother students are lounging about and the words of the instructor galvanizes them into action. The machine is turned around preparatory for a flight. One student mounts the machine and examines the level of the gasoline in the tank, and if necessary replenishes it. Another takes up his position at the propeller, ready to crank the motor, while a third submits the pontoon to an examination in order that no small cracks or fractures may go unrevealed. By this time another student perhaps has helped you to button your "duster." It might be explained that "duster" in the vernacular of the flying camp means a short quilted jacket intended to fulfil the function of a life preserver in case you and your instructor fall into the lake.

### *Conquered the Fear.*

By this time you have conquered any fear which may have suddenly arisen in you, and you take your seat beside the instructor. About this time one of your comrades may slip up beside you and tie a string around your knees. When you ask what the meaning of this proceeding is you are informed that it is to keep your knees from knocking together, and then there is general laughter. The instructor takes a last look at the motor and informs you that your first duty will be to retard the motor as he will shortly be busy with the throttle. The student whose duty it is to crank the propeller shouts "safe," the instructor replies "safe," and then the propeller is given a few preliminary spins and everything

is now in readiness to make the start. The man at the propeller shouts "put her on," and with a sharp, swift downward pull on the propeller, the motor is started. It must be remembered that aviation motors are relatively higher powered than automobile motors and are unmuffled.

### *A Tremendous Din.*

The din that an eighty-horsepower motor can make situated immediately behind your head can better be imagined than described. This does not in any degree contribute to your composure. When your instructor is satisfied that the motor is turning over strongly, he waves his hand and the machine immediately commences to slip down the quay toward the water. When it reaches the water the motor is throttled down until the lake proper is reached through a somewhat narrow channel. Notch by notch the motor is let out, and by this time you find yourself racing over the surface of the water at express train speed. Small patches of weeds are seen in the distance and no sooner, it seems, are they sighted than you shoot across them. By this time the first shock has disappeared and you begin to observe the movements of your instructor. Firstly, by means of the foot bar you will see him take up a straight course and then he will correct the attitude of the machine transversely, this being accomplished by means of the ailerons of the auxiliary movable fins on the extreme ends of the main planes.

### *The Vital Movement.*

When this has been done the vital movement will take place. When you see him begin to move his elevator you will know that you are about to leave the surface of the water, and glide into the air. If the machine is flying strongly he will "baby" her into the air. The dream of



your life is about to become a reality. By this time the exhilaration incidental to your mad rush over the surface of the water has invaded your whole system, your blood flows fast. Perhaps you will turn your eyes upward, and when you again glance downward you will see the water lying many feet below you. You have committed yourself to the tender mercies of another element. You are struck with amazement. There is no jumping about, no wild buffeting by the air currents about which you have read so much. The machine mounts with the steadiness of an ocean liner coming into her pier. The next time you look down, the water seems a long way off. It, however, inspires no fear. The hills which bordered the lake and appeared so high have shrunk into nothingness; you are above all things terrestrial cavorting with the birds.

#### *Traveled Many Miles.*

By this time you may have traveled many miles from your quay, and suddenly you feel the machine taking on an alarming lurch on one side. Over it continues to go until you gaze appealingly at your instructor. He smiles and continues to keep her lopping. Then you will observe he is turning and is banking the machine. This lopping is necessary to preserve an equal pressure on both sides of the planes. Reassured, you then settle down to enjoy every moment of the trip homeward. During this portion of the journey the instructor takes more altitude and you begin to wonder how he will ever get this great machine down onto the surface of the water. While this thought is passing through your mind you feel yourself together with the machine suddenly thrown forward, and for the first time you are undergoing the sensations of an aerial dive. The water which formerly looked so far away is coming at you at a terrific speed, and you begin to wonder if your instructor has lost control, and you look at him again and he smiles again at you and you feel that all is going right. It must be remembered that this dive is generally taken at the rate of a hundred miles an hour and that moment when you imagine that no human power can save you from being taken from a tangled mass of wreckage beneath the great machine, she levels out and you strike the water as tenderly as a bird lighting on its nest. In a few more seconds you are on land busily answering the questions of your newly found friends. They all want to know how you liked it, and when you say you enjoyed it they all pipe up in unison, "Isn't it great!"

#### *The Second Time.*

The second time you go out your instructor begins to teach you the methods of controlling the machine. Just here it might not be out of place to say a word about these instructors. Flying has bred a new man. As a rule, they are big-hearted men who are possessed with a single idea and that idea is to provide every safeguard for their students. When a student makes his first flight alone it is rare indeed that they suffer mentally half as much as their instructors. The interest that they display in their students is deep-seated and genuine. When they give the first directions with regard to the management of the machine they waste no time or words on a pedantic explanation of the aerodyna-

mics of flight. Their instructions are terse and to the point. Frank Burnside, who is chief instructor at the Thomas School of Aviation at Ithaca, N. Y., where the writer together with many other Canadians have been undergoing a course of instruction, is one of the most successful instructors in America. He is an aviator of long experience. No money and no influence in the world would cause him to take a pupil out or allow a pupil out alone for the first time if he did not feel that conditions were exactly right. A man of few words, he has learned by experience the dangers incidental to flying, and never leaves anything undone to preserve the safety of his students. On the second trip he points to the rudder and says simply, "That is to steer the machine, now try and get that into your nut;" "this thing," pointing to the elevator bar, "is what makes the machine go up and down;" and this, indicating the wheel, "warps the planes to keep you from tipping over, now I want you to get this dope and get it good." If you make any "bonehead plays" when you are out with him he does not forget to tell you when you reach the land. He rarely pays anyone compliments in their presence, saving such remarks for the time when you are absent.

#### *Certain Reaction Sure.*

Generally you learn that certain reactions result from any movement of the controls. At first you are somewhat bewildered by the complexity of the controlling gear, but almost imperceptibly these motions become instinctive, and when they do you are rapidly nearing the time when you will be permitted to fly alone. There is one thing which a flying man is taught to fear above all others and that is "stalling." This condition of affairs results from climbing at too great an angle. To extricate one's self from a "stall" it is necessary to "nose" your machine which about sums up the total of the methods to be practiced in the air when you get into trouble. The all important thing in flying is speed, because when you have speed it is possible to correct the attitude of your machine.

The art of flying can be acquired under happy conditions at the Thomas School. Ithaca is a university town, being the seat of Cornell University, where six thousand boys are receiving their education. The city itself is one of the most beautifully situated in the United States. The Thomas factory is adjacent to the flying field, and the lake, and every facility is offered the student to study every phase of aviation. Great military flying machines are being manufactured there for the British army and navy under the supervision of army and naval officers. Rainy days, when flying is rendered impossible, can be utilized to advantage in the factory, where the study of structural methods can be pursued. The school is not overcrowded, and the greatest amount of personal attention is conferred upon each student with the result that a man leaves it with a wide knowledge of aviation in all its various phases. The living expenses are extremely reasonable, and even if one is not preparing to enter either of the services to do his "bit," no more delightful method of spending a holiday could be devised than is offered by taking a course at Ithaca.

Students at the Thomas School. Standing (left to right, (Messrs. Drumond, Somerville, Austin, Derby, and Kenny. Sitting, Fay and Broch, with Lewis in front.







# FOREIGN NEWS



## BELGIUM

A dispatch from the Echo Belge, under date of September 14, states that aeroplanes of the allies dropped bombs on the city of Ghent and though heavily attacked by German artillery succeeded in accomplishing their purpose. The objective was to stop the operations of an important cotton factory.

Six bombs were dropped directly on the building, which speedily caught fire and was completely destroyed. About forty German soldiers are believed to have been killed or wounded by the explosions.

## FRANCE

Writing from British General Headquarters under date of September 13, a correspondent of The Daily Chronicle says:

"Two German aeroplanes were brought down in our lines today. The fate of one of them was preceded by an act of desperate bravery which won the admiration of our men in spite of their own peril.

"This Taube was sighted over our lines early this morning. It was one of the latest types armed with two machine guns—one fore and one aft—and flew at great speed. Nevertheless, one of our own aeroplanes, with smaller wing-spread and of lighter make, immediately mounted and gave chase. The enemy accepted the challenge and a thrilling duel took place, the two machines circling about each other, manoeuvring for position and firing at each other repeatedly.

"The pilot of our aeroplane showed the finest skill in banking about his adversary, and a remarkable shot hit the German machine in the petrol tank. It began to fall, and it was then clear to the two unhappy men in the biplane that they were dashing down to certain death; yet, without losing their nerve or pluck, they maintained their rapid fire. The men crashed to earth and both were killed, but the machine was not much damaged and may be flown by our own aviators.

"The second Taube, which appeared later in the day, was also hit in a vital part, and burst into flames."

Trèves, the ancient city of Rhenish Prussia, was attacked September 14 by a squadron of nineteen French aeroplanes, which dropped 100 shells there, hitting the station and the Bank of the Empire, according to the French War Office bulletin.

Another squadron penetrated to Donaueschingen (75 miles from the French frontier and at the confluence of two rivers forming the Danube) and Marbach (in the Black Forest).

The story of the death of Adolphe Pegoud, the French aviator, who was killed recently near Petite Croix in a battle in the air with a German aviator, is related by Pilot Corporal Kandulski, his conqueror, in a letter to his father, which is published in the "Tageblatt":

"While flying," says the letter, "the forts of Belfort opened fire against me, the shrapnel bursting around in the clouds. I was hardly out of range of the enemy's guns when suddenly a French machine approached. The fighting took place at a height of 2,400 metres (about 8,000 feet).

"The first thing I did was to swing sharply around, in order to obtain a free range to the flank. My observer, Lieutenant Billitz, immediately fired the machine gun which, after the thirtieth shot, refused to work. Meanwhile Pegoud approached to fifty metres. I encircled him once and suddenly executed a sharp curve to the left, whereby I got him on the flank and Billitz, whose machine gun again was in order, gave him his rest."

## GERMANY

The German Admiralty gave out an account of the Zeppelin raid over London on September 8. The statement follows:

"German naval airships successfully attacked on the night of September 8-9 the west part of the city of London, large factories near the port of Norwich and the iron works at Middlesbrough.

"Great explosions and numerous fires were noticed. The airships were shelled violently by the enemy's batteries, but all returned safely."

Count Von Reventlow, the naval writer, in the Tageszeitung, September 15, replies to British criticisms of German airship raids over London. He stated that London is a fortress and that Sir Percy Scott, the newly appointed defender of the city from aerial attacks, should order the civil population of London to depart. The Count asserted that it

was not Germany's responsibility that the fortress of London, attacked many times, had not been evacuated, and stated that the failure of the British Government to order the people to abandon it showed "disdainful disregard of the principles of humanity, civilization and international law."

## GREAT BRITAIN

It was officially announced September 13 that Admiral Sir Percy Scott, Bart., ex-Director of Naval Gunnery Practice, had been appointed to take charge of the gunnery defences of London against attacks by enemy aircraft. Commenting on the appointment the Daily Chronicle said editorially:

"The public will welcome the announcement that Admiral Sir Percy Scott has been appointed to take charge of the whole service of anti-aircraft guns for the defense of London against Zeppelins.

"We have been fortunate so far in escaping any important damage from the material or military point of view on the occasion of the recent Zeppelin visits, but the man in the street, without wishing to murmur unduly against those in authority, is inclined to ask why the Zeppelins have been equally fortunate. Having seen how readily an airship at a great height can be picked off by a searchlight, he wonders why it cannot be picked off by a gun, bearing in mind the size of the target and the fact that its distance, though great, is short compared to those at which naval actions are fought.

"Of course, only a very special gun has the requisite vertical range, but it exists, and there is no reason why we should not have enough of it."

The adequacy of the air service was the subject of some criticisms in the House of Commons September 15. Arthur J. Balfour, First Lord of the Admiralty, admitted that the provisions which had been considered sufficient at the beginning of the war had to be materially developed. He said, however, that the service was now being supplemented far more rapidly than was the danger it was organized to meet.

September 13, 14 and 15 saw a continuance of the Zeppelin raids upon the East Coast, and upon London. A hostile aeroplane visited the Kentish coast September 13, dropping bombs which resulted in a house being seriously damaged and four persons injured. The aeroplane was chased off by two naval seaplanes.

While nothing is allowed to be published or cabled as to what places were hit in London during the night raid September 7, it is surmised that bombs have been dropped in the heart of London about Trafalgar Square. Thirty-seven persons were reported dead, including several women and children. A large number were injured and many fires were caused by the incendiary bombs. One soldier was killed and three injured. This is the first time that any except non-combatants have suffered in the Zeppelin raids.

Despatches from London would indicate that, since the raid, the plans for defending the capital have been radically changed, as the result of a conference between naval and aeronautical experts. "It will be a lucky Zeppelin that succeeds in passing the outskirts of the city," was the significant statement of Sir Percy Scott, after the conference.

The commander of one of the Zeppelins that flew over London left Sir Edward Grey a memento in the form of what was apparently the blade bone of a horse or an ox, on which were several sketches or diagrams, and the inscription "a present to Sir Edward Grey, with the compliments of the commander and officers."

Claude Grahame White is no longer flying. He is in charge of repairs to airships for the British Government and in war time, with the air fleet constantly increasing in size Mr. Grahame-White and his force are more than busy.

## ITALY

The following official communication from the headquarters of the Italian Army was made public September 19:

Our dirigibles have made a raid over the enemy's aerodrome at Aisozizza, dropping forty bombs there. We also bombarded the junction and viaduct on the Nabresina Railroad. The dirigibles returned to our lines unscathed.

Enemy aeroplanes threw bombs on undefended towns, such as Asiago and Bassano. A few civilians were injured and slight material damage was done, but no soldiers were hit.



The 114 miles an hour Sopwith scout, one of the most important instruments of the British aerial fleet. It is so fast that it is hard to find pilots for it.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



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### The Lauder World's Record Model

In our issue of May 31st we gave a general description of this model, which at the present time is the holder of the world's records for distance and duration for hand launched models. In order that those interested may obtain an idea of the constructional details that tend to make the model the wonderful flyer it is, we will attempt to give a very complete description of the model. Some time before the National Competitions were held the model made a flight of 195 seconds, this constituting a world's record for duration for this type of model. In the contests the model flew 3,537 feet, which is also a world's record for distance. It will therefore be noted that this model is both a distance and duration flyer, both qualities being seldom found in one model.

Reference to the accompanying drawings will give a clear idea of the constructional details.

The frame or fuselage consists of two side members 40 inches in length, of straight grained spruce. At the center each member is of approximately circular cross section, and is  $\frac{1}{4}$  of an inch in diameter. The members taper to about

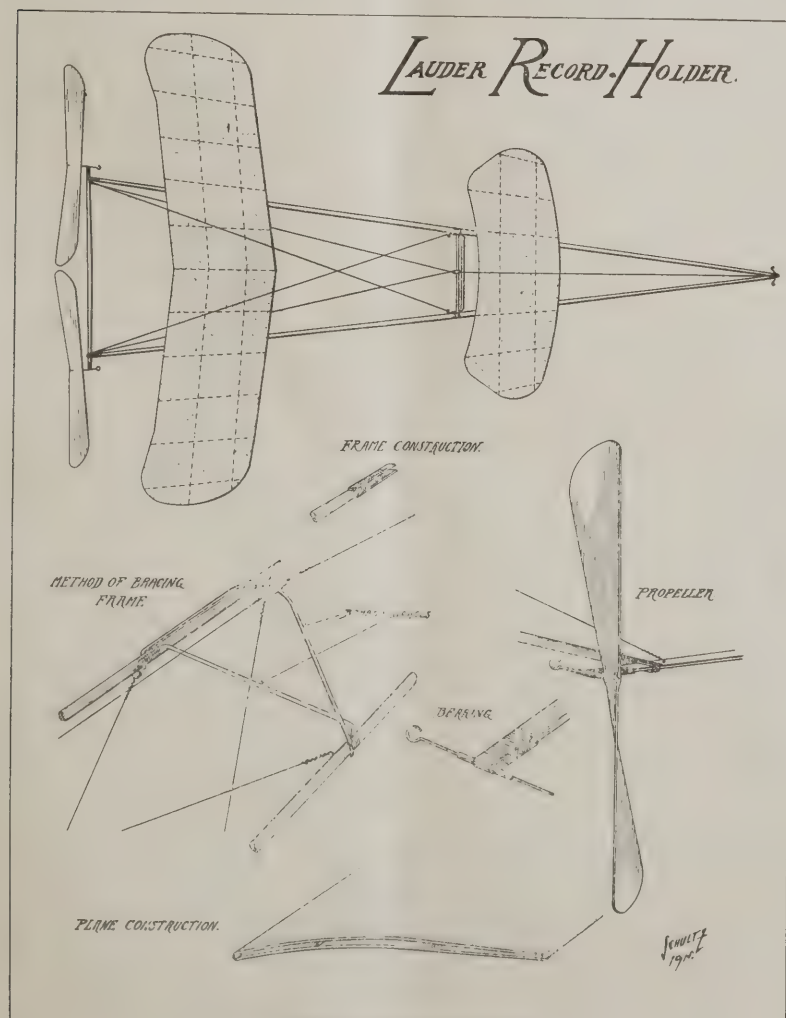
$\frac{3}{16}$  of an inch at the ends, the circular cross section being maintained throughout. The frame is braced by a strip of bamboo of streamline form, extending from one side member to the other, 18 inches from the apex of the frame. The ends of this brace are bent to run parallel to the side members of the frame, where they are secured by binding with silk thread and gluing. Piano wire hooks are also secured to the side members of the frame adjacent the ends of the cross brace, and from these hooks extend wires of steel (No. 2 music wire), which run diagonally to the rear brace or propeller bar where they are secured. The frame is braced further by an upwardly arched strip of bamboo, as shown in the drawings, this strip being  $2\frac{1}{2}$  inches in height. At the top of this brace are two bronze strips of No. 32 gauge, one above the other, and one on top of the brace and the other below. Adjacent the ends of these strips of metal are perforations, through which pass bracing wires, one of which wires run to the apex of the frame, where a hook is mounted for its reception, and the other two wires extend to the rear of the frame where they are secured to the propeller brace. The propeller brace consists of a strip of streamlined spruce,  $11\frac{3}{4}$  inches in length, the propellers being at an angle, thus clearance is allowed,  $\frac{1}{4}$  of an inch wide at the center, tapering to  $\frac{3}{16}$  of an inch at the ends. The ends of the propeller brace extend out 1 inch from the side members of the frame, to allow room for the rubber motors. In order to avoid slotting the ends of the side members of the frame so that the propeller brace can be secured therein, thin strips of bamboo are secured above and below the end of each side member, by binding with silk thread and gluing, the space between these bamboo strips being utilized for the brace which is securely bound and glued therein. The propeller bearings consist of strips of very thin bronze (No. 32 gauge), about  $\frac{3}{16}$  of an inch in width, bent over  $\frac{5}{8}$ -inch strips of German silver tubing, the tubing being soldered to the bronze strips and the propeller brace, which fits between the upper and lower portions of the bronze strips, is securely bound and glued thereto.

The propellers are cut from solid blocks of pine, and are 12 inches in diameter. The blade, at its widest portion, measures  $1\frac{3}{8}$  inches. The blades are cut very thin, and in order to save weight, they are not shellaced or painted.

The propeller shafts are of piano wire (No. 20 size) to fit the tubing used in the bearings, pass through the propellers and are bent over on the outer side to prevent turning. A few small bronze washers are interposed between the propellers and the outer ends of the tubing to minimize friction when the propellers are revolving. Twelve strands of rubber are used for each propeller, the rubber being  $\frac{1}{8}$  inch flat.

The planes are both double surfaced, and are of the swept back type. The span of the main plane is  $28\frac{1}{2}$  inches, with a chord of  $6\frac{1}{2}$  inches. The elevator has a span of 15 inches with a chord of  $4\frac{3}{4}$  inches. The main plane has eleven double ribs, these ribs being built up on main beams of spruce,  $1/16 \times 3/16$  inch, the front beam being placed  $1\frac{1}{4}$  inches from the entering edge, and the second beam being 2 inches back from the front beam. The entering and trailing edges are formed from a single strip of thin split bamboo, all the joints being made by binding with thin silk and gluing. The elevator

(Continued on page 42)





**California Aeroplane Squadron Committee Active**

The formation of the Aeroplane Squadron Committee in Los Angeles has greatly stimulated the movement for National Defense. Similar committees have been formed at Tucson, Arizona, and El Paso, Texas, with the intention of affiliating with the Aeronautical Society of California in its work. These committees are composed of prominent and influential men who are now raising funds for the purchase of an aeroplane and for operating expenses.

The Tucson committee consists of Kirk T. Moore, Col. Epes Randolph, T. H. Williams, E. G. Mustain, L. H. Manning, J. E. Owen, E. R. Ladd, Allan B. Jaynes, Acting Mayor A. C. Bernard, Judge W. F. Cooper, Capt. M. G. Browne, Chas. F. Solomon, Albert Steinfeldt, N. E. Plummer, Senator Andrew P. Martin, C. W. Hinchcliffe, D. E. Wilson and E. B. Frawley.

The El Paso committee are J. C. McNary, V. P. First National Bank, El Paso; Mayor Thos. C. Lee; R. B. Orndorff, Pres. Chamber of Commerce; Wm. E. Mix, Pres. Ad. Club; A. E. Rowlands, Pres. Rotary Club; George C. Robertson, Hon. John W. Fisher, L. M. Gasser, John Wyatt and Malcolm Fraser.

The following telegram just received from Tucson indicates that their efforts are meeting with success:

"All arrangements practically completed for securing aeroplane with instructor. Meeting to be held Tuesday night to perfect details. Please wire my expense for use at this meeting how many men should be enlisted on a basis of one aeroplane and what should be figured for monthly expenses."

The Adj. General of California, C. W. Thomas, Jr., has just forwarded the following letter from the Division of Militia Affairs, Washington, D. C.:

"1. Replying to your letter of the 4th instant on the subject of an aviation corps for California, I am directed by the Secretary of War to advise you as follows:

"2. Each State is the sole judge as to what units of Organized Militia, if any, it shall maintain. Providing any particular unit is organized in conformity with the requirements of the Tables of Organization, and is properly equipped and instructed, the Federal Government has no option but to recognize such unit as a part of the Organized Militia, entitled to share in Federal funds. In this respect aero units are in exactly the same position as other units, for example, those of the infantry arm.

"3. The War Department is anxious that there should be an aero squadron in each Organized Militia division district. The Sixteenth Division now has no aero units. The organization in California of at least one aero company (the smallest recognized administrative unit), is therefore considered highly desirable. Unfortunately there is no special fund available for this particular branch and, accordingly, all expenses will have to be met from the State's allotment under Section 1661, Revised Statutes, and the Act of May 27, 1906.

"4. The following data has been furnished this office by the aviation branch of the Signal Corps, United States Army:

"(a) The initial cost of the equipment of an aero squadron (two companies) is approximately \$235,000.

"(b) Maintenance of each machine averages about \$5,000 per year.

"(c) Machines have to be replaced about once a year.

"(d) No aviator, however skillful, is dependable from a military standpoint unless he has had such service with troops as to understand the significance of military formations.

"(e) Assuming that the aviation student has a good practical and theoretical military education to start with, an average of six months' instruction with daily flights is the average length of time required to qualify for the grade of junior military aviator."

This letter is sufficient authority to enable us to proceed, as our organization will be in strict accord with the "Tables of Organization," although its equipment will not be "Standard" or complete.

As the Los Angeles Squadron already has its temporary equipment, and the California National Guard has agreed to supply the uniforms, side arms and Armory, the committee is now ready to proceed with the actual organization.

Practically every member of the committee of 100 has agreed to join the Aeronautical Society of California, and the initiation fees and first year's dues from this source alone amount to \$2,500. This money is now being received and will be used to employ instructors, for repairs, tools and publicity work. The State-wide movement to secure a membership of 1,000 will soon be launched, and in this work the co-operation of civic leaders throughout the State is now being asked.

This campaign should net \$25,000, which will practically support the squadron for a year. At the end of this time the Federal and State Governments should have appropriations enabling them to assume this expense. While others "talk" National Defense, we can be doing something practical.

**U. S. A. Aviation Notes**

Captain Hanson B. Black, S.C., upon arrival in the United States, will proceed to Fort Sam Houston, Texas, and assume command of Telegraph Co. H, S.C., relieving Captain Edwin A. Hickman, S.C., who will proceed at the proper time to San Francisco, Cal., and take the first available transport for Hawaii to assume command of Field Co. E, S.C. (Sept. 15, War D.)

First Lieutenant Thomas De W. Milling and First Lieutenant Ira A. Rader, aviation officers, S.C., are detailed as members of the board of officers appointed to meet at Fort Sill, Okla., vice First Lieutenant Joseph C. Morrow, Jr., and First Lieutenant Henry W. Harms, aviation officers, S.C., relieved. (Sept. 15, War D.)

First Lieutenant Robert H. Willis, Jr., aviation officer, S.C., to Brownsville, Texas, for duty with the First Aero Squadron, Signal Corps. (Sept. 13, War D.)

First Lieutenants Byron Q. Jones and Henry W. Harms, aviation officers, S.C., will proceed to Boston, Mass., for the purpose of taking a special course in aerodynamical engineering at the Massachusetts Institute of Technology. (Sept. 13, War D.)

**Sturtevant News**

Mr. Noble Foss, manager of the Aeronautical Gas Engine Dept. of the B. F. Sturtevant Co. of Hyde Park, Mass., recently underwent a successful operation for appendicitis and expects to be back at his desk within a few weeks.

The 140 h.p. eight-cylinder Sturtevant aeronautical motor which has created such a profound impression in aeronautical circles both here and abroad was developed under Mr. Foss's personal supervision. These motors are now being built in large quantities and preparations are now under way to produce these motors at the rate of ten per day within a short time.

**Saint Louis News**

The Excelsior Propeller Company of this city reports unusual activity amongst the exhibition flyers of the United States. During the past month forty propellers have been shipped to this class of purchaser alone. The month broke all records for the company, but represents the culmination of seven years' steady growth and is by no means a spasmodic accident.

On Sept. 10th the Stone Flying Boat collided with a barge on the Mississippi. The damage to the machine was slight, but the Landsmann Rotary Motor received injury which will require several days to repair.

**Scarcity of Clear Spruce**

"Clear spruce such as is desired by constructors of airships," said a wholesale lumber man, "is very scarce. We can not get enough of it to meet the demand, and it seems to me that the builders will eventually have to find something else to take the place of spruce. The stock that they want comes from the heart of the tree and well up in the trunk. Virginia and the Adirondacks contribute some of it. The spruce from the Pacific Northwest is not preferred by the airship builders. When general business conditions pick up, causing a better general demand for ordinary lumber, that will give us more clear spruce, but until that time clear spruce suitable for aircraft is likely to be scarce."

**Renault's Aviation Twelve**

The first important departure in France from the rotary air-cooled aviation motor has been made by Renault of automobile fame, who is turning out large numbers of new twelve-cylinder, water-cooled motors that are being fitted to aeroplanes of large capacity.

The new motor, which has been thoroughly tested at the national aviation laboratory, has a bore and stroke of practically 4 by 6, and has its cylinders cast in pairs and mounted on an aluminum crank chamber. There are two valves per cylinder inclined in the head, and operated by a fully inclosed camshaft running down the head of each line of cylinders. The ends of the rockers project through the housing as in the case of the Mercedes. The drive for the camshafts is obtained from the front end of the motor by means of bevel gearing and shaft, the entire mechanism being contained in a neat aluminum housing. The oil pump is placed cross-wise at the foot of the two shafts, giving camshaft drive.

Two special Zenith carburetors are used, each one being outside the cylinder group and close up to the crankchamber. In each case the intake valves are on the outside and the piping is reduced to a minimum. Magneto and water pump are carried across the front of the motor. No flywheel is used. The only visible moving parts are the valve stems and the ends of the rocker arms.





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Inopportune

"I can't swim!" shouted the aeronaut who had disembarked himself into the water. He went under, and when he came up he shouted again: "I can't swim!"

The man on the bank watched him with languid interest.

The man in the water sank again. When he came up he gasped: "I can't swim!"

"Well, my friend," commented the man on the bank, "this is a queer time to be boasting of it."—*Tid-Bits*.

"One popular type of beauty proclaims itself, in its fullest material development, at every shop in which an illustrated periodical is sold. The same fleshy faced girl, with the same inane smile, and with no other expression whatever, appears under every form of illustration, week after week, and month after month, all the year round." But we're not in this class!

#### In 1950

An officer was showing an old lady over the monster war-plane. "This," said he, pointing to an inscribed plate on the deck, "is where our gallant captain fell."

"No wonder," replied the old lady, "I nearly slipped on it myself."—*Exchange*.

Why not turn the Navy over to Brother Ford? In six months he would be turning out a battleship every forty-nine seconds.—*Life*.

#### A Chance Yet

Tom (who has just proposed in the air)—Is it true that you proposed to Alice and were rejected?

Jack—Not exactly rejected—just said when she felt like making a fool of herself she'd let me know.—*Boston Transcript*.

Said he to she, "Come fly with me!

"My love can never die!"

Said she to he hygienically,

"How dare you? Swat the fly!"

—*Cornell Widow*.

#### A Clever Husband

"So your wife has stopped bothering you for an aerobus?"

"Yes; I tipped off a palmist she patronizes to warn against ever riding in one."

#### He Won Out

Once again sometimes there was an aviator in love. Leastways he was so far gone that he begged his girl for her picture, in terms of endearment, as follows:

"Oh, Sadie, thou beautiful doll, if you wilt but grant me the boon of thy precious portrait—though I know art is a dead failure in trying to represent a live one such as thee—I will prize it beyond my bankbook, and carry it next to my heart forever, and then awhile longer."

So Sadie let him pay for a sitting and half-a-dozen finished up while you wait.

Shortly afterward there was a scrap, and the girl wanted her picture back. Then the fellow wrote her, to wit:

"Dear Miss Miffle—Yours to hand, and would state that I am unable to identify your photo amongst the big collection I have. If you care to call at my boarding-house any morning after I am gone to business, the landlady will set out the barrel for you, and maybe you can pick out the likeness you want, as I have no further use for it."

Moral:—Not on your tintype!

HENRY TYRRELL.

#### Substitutes

Tourist (in village notion-store)—Whaddya got in the shape of aeroplane tires?

Saleslady—Funeral wreaths, life preservers, invalid cushions and doughnuts.—*Judge*.

#### A Bird Anyway

Knicker—Is Jones a night owl?

Bocker—No, an ostrich; he thinks nobody has seen him if he can hide his head the next morning.

#### Not an Aviator

A Mississippi River steamer was stopped in the mouth of a tributary stream owing to a fog. An old lady passenger inquired of the Captain the cause of the delay.

"Can't see up the river," was the laconic response.

"But I can see the stars overhead," said the old lady.

"Yes, ma'am," continued the Captain, "but until the boilers bust we aint going that way."



"Look out! It's a Zeppelin!"

(Courtesy, N. Y. World.)



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(Continued from page 39)

is constructed in like manner, except that it only has seven ribs, and the measurements are as above set forth. Both planes are covered with goldbeater's or "zephyr" skin, which is first glued in place and then steamed, and given a coat of a preparation used for this purpose.

### Aero Science Club of America

In view of the fact that there are but few places in the vicinity of New York City that are adapted for the holding of the hydro contest, it was decided at the last meeting to hold the contest on September 26 at Garden City by the use of an improvised pond. This method was tried out before, and the results were most satisfactory. Those who will represent the club are as follows: Mr. Thiele, Mr. Charles William Meyers, Jr.; Mr. Frank Broomfield, Mr. G. A. Cavanagh. The substitutes will be: Mr. Egbert P. Lott, Mr. Rudolph Funk, Mr. William Hodgins, Mr. R. C. King, Jr.

The members will commence to arrive at the field early in the morning with two or more models, and many trial flights will be made.

It is expected that the Bay Ridge, Summit and Harlem clubs will participate in the contest.

Mr. Gustaf W. Granberg, Worcester's only aviator, paid a short visit to the club, and stated that he was having prepared two silver cups to be given the winners of two model aeroplane contests which he will arrange for in his locality.

For further particulars, write the Secretary, 29 West 39th street, New York City.

### Illinois Model Aero Club Ward Pease

Sunday, September 12, the elimination meet for the hydro event of the National Model Aeroplane Contest was held at Lake Calumet, where the boys were the guests of Mr. Charles Dickinson.

A high wind blew all afternoon, but went down enough for flying shortly before night. The results were as follows: Cook, approximately 80 seconds; Schweitzer, 59 seconds; Pease, 42.4 seconds; Lucas, 36.6 seconds; Hitt, 35.4 seconds; Hittle, 30 seconds.

Owing to trouble with the stop watch, Cook's flight can not be taken as official, or it would be a world's record. The 30 seconds made by Hittle model constitutes a new world's record for a single propeller tractor hydro, as it was properly judged and witnessed.

On Monday, September 13, six of the I. M. A. C. boys left for Milwaukee, to fly with the Milwaukee Model Aero Club, at the Wisconsin State Fair, which was held in Milwaukee from the 13th to the 17th. The six were Wells, Sindell, Lucas, Wrixon, Cook and Pease. On Monday there was little flying owing to high winds, although Wells made several good flights.

On Tuesday the speed contest was held over a measured course of 300 feet. The three best flights were: Pease, 7.2 seconds; Cook, 10 seconds; Lucas, 10.2 seconds. Pease's speed was 25.2 miles per hour, and he won the silver cup offered for the event. The other prizes were silver and bronze fobs.

On Wednesday the loop-the-loop contest was held, and was judged by the number and quality of the loop. Cook won the first prize of \$6.00, Pease the second prize of \$4.00, and Lucas the third, \$2.50.

The last competition in which the I. M. A. C. competed was in parachute dropping, and owing to the difficulties their meet was extended over two days. After many attempts, Wells got one fine drop from a good altitude, dropping while the parachute was open, 20.4 seconds. Cook came next with 16 seconds, and Pease third, with 5.2 seconds. The prize money was the same as in looping.

All during the State Fair week the Milwaukee boys were holding separate contests for cups offered for hand launched distance and duration, R. O. G. distance and duration and workmanship on scale models.

No Interclub meet was held owing to the many meets to be run off at the State Fair, and to the fact that no good field was available, but no doubt there will be more interclub meets next year.

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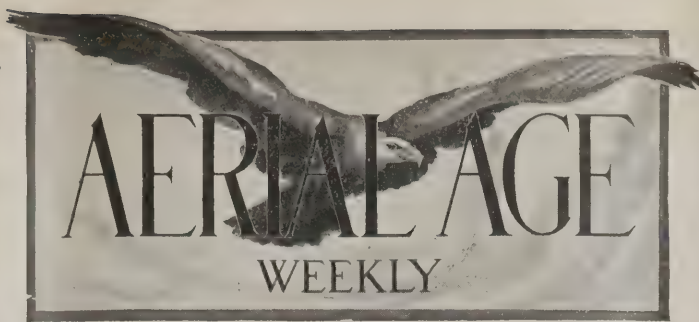
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NEW YORK, October 4, 1915

No. 3

### **\$5,000 More for National Aeroplane Fund— Sixteen States Developing Aviation Corps for Militia**

A CHECK for \$5,000, to be used for training of officers of the Militia in aviation, has been given to Mr. W. Redmond Cross, a Governor of the Aero Club of America, by a person interested in the movement to develop aviation corps for the Militia of New York and Massachusetts. This person whose name is withheld from publication on request, realizing the need of having officers of the Militia trained in aviation as a preliminary step toward forming aviation corps, has given this amount for training officers of the Militia of the states of New York and Massachusetts.

This is the second large subscription received from patriotic persons interested in the movement to develop aviation corps in the Militia, who do not wish their names made public, the other subscription having been one of \$10,000 for the purchase of an aeroplane and the training of two officers of the National Guard of New York. This was given by the prominent woman who gave \$1,000 to the National Aeroplane Fund to carry out the general plans of the Aero Club of America to develop aviation corps and supply aeroplanes and aviators to the Militia for their maneuvers.

This offer of \$5,000 makes it possible to start the movement to give aviation corps to the Militia of Massachusetts, where for the past year or so Adjutant General Cole has been trying unsuccessfully to get an appropriation for the purpose.

This will make seventeen states where the movement has been started, the other states being Arizona, California, Florida, Illinois, Iowa, Maine, Missouri, Nebraska, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Vermont, Texas and Wisconsin.

The successive steps in developing this movement in different states is as follows:

1. Interesting the Militia authorities, local sportsmen and workers for National Defense (which is being done throughout the country simultaneously).

2. Arranging to have officers of the Militia—both the Naval Militia and the National Guard—assigned to aviation, and as fast as funds permit to have the officers trained to pilot an aeroplane as well as in the art of military aeronautics. These officers then become instructors for the many volunteers who want to join the aviation corps of the Militia.

3. As fast as funds become available aeroplanes are supplied. As the amount necessary to supply the National Guard of the Forty-eight states and the Naval Militia of the twenty-three states, having such organizations, with aeroplanes is a very large one, efforts are made to get the government of the state to supply the aeroplanes and provide for the upkeep of the aviation corps thereafter. In the meantime aeroplanes are supplied as fast as the funds permit.

So far, the State of New York is the only one to have aeroplanes in both the National Guard and Naval Militia. A Curtiss flying boat and a course of training for both an officer and a mechanic was presented to the Naval Militia of New York last summer, and Ensign Lee H. Harris and Electrician Robert Kahl of the First Battalion, of which Charles L. Poor is commander, are completing their course of training at the Curtiss Aviation School at Buffalo.

An aeroplane and courses of training for two officers and two mechanics was presented to the National Guard of New York last month by a prominent and patriotic woman, who does not want her name made public, and the officers and men are now being selected to take up the courses.

To insure the utmost efficiency from the standpoint of national defense, the policy adopted in all cases has been to have all the Militia authorities co-operate with the War and Navy Departments in developing the aviation corps, so as to have all the militia aviation corps organized on a plan harmonizing in every possible way with the Army Aviation Corps and the Naval Division of Aeronautics. This will insure the utmost efficiency, and in case of need every militia aviation corps will be a unit that can easily be added to the other units to form a valuable and efficient air fleet.

### **Fifteen Aeroplanes a Day for Europe**

AN average of fifteen aeroplanes per day are now shipped to Europe by the Curtiss Aeroplane Co. of Buffalo, N. Y.; the Burgess Company of Marblehead, Mass.; the Thomas Brothers Co. of Ithaca, N. Y., and the Glenn L. Martin Co., of Los Angeles, California.

Thus, as many American aeroplanes are shipped to Europe each day as the United States Army and Navy have in commission!

### **A Congressman Who is Truly Our Representative**

WE have had occasion in the past to comment on the fact that Congressmen like J. J. Fitzgerald and James R. Mann are not "representatives," as they act on most important measures without consideration of the welfare of the country, only considering matters which further their political aims. It is a pleasure, therefore, to present herewith the address of Congressman Snyder of the 33rd New York District, delivered on Labor Day:—

"To my mind, one of the greatest developments in scientific warfare which the present struggle in Europe has produced has been the rapid rise to a position of the utmost importance of the aeroplane. No sooner had the first successful biplane been launched into the air some years ago than the discussion began as to the merits of the heavier than air machine for war purpose. The conjectures as to its possibilities ranged from one extreme to the other. On the one hand, were those who looked ahead to the day when the aeroplane would be absolutely invincible as an engine and destroyer. They could see it with its freight of high explosives totally annihilating the armies of the enemy. On the other hand, was a small



body of pessimists who frowned upon it as entirely impracticable for any purpose whatsoever other than as an exhibit at county fairs. Between these two extremes was a wide range of possibilities. The war came and with it an opportunity to put all of those theories to the test. As in a great many cases of this kind neither of the extreme theories was found in practice to be correct, but there was found to exist the absolute efficiency of the aeroplane on broad middle ground.

"In these days of modern warfare with battle fronts ranging hundreds of miles in length, before the enemy can be defeated, he must first be found. And it is this problem of reconnaissance that the aeroplane has solved to the most efficient degree attainable under modern methods. Thousands of feet in the air, out of range of any but the heaviest guns, presenting a target almost infinitesimal, an observer can float lazily over the lines of the enemy, and as easily as if sitting at an office desk, can draw in detail on his map the exact location and strength of the hostile force. Of what inestimable value is such information to the earth-bound commander many miles back of the line has been adequately proven a multitude of times already and is being further demonstrated every day as the war progresses. The result is that to-day the world sees the army go forth to battle, not as in the old days, ponderous, slow and blindly groping in the dark, but preceded and accompanied by a myriad of soaring specks in the sky, the eyes and ears of a modern campaign.

"A nation that does not number its military and naval aeroplanes by the thousands has become obsolete over night. As well equip a regiment with bows and arrows as to send it forth unaccompanied but confronted by these most efficient implements of the battlefields of to-day. Without them we may have an army, but it will be as a mole burrowing aimlessly in the darkness.

"Where do we as a nation stand in this matter? Here are a few statistics which I have taken the time to look up and which are a matter of record. Our army, navy and militia combined have all together less than 20 aeroplanes. The nearest of the army aeroplanes are at present at Fort Sill, Okla. The nearest of the navy, at Pensacola, Fla. Our own Empire State and the great Atlantic seaboard are absolutely unprovided for. Is this deficiency in numbers due to the fact that our Government does not realize their importance? For an answer to this question, one has only to consult the files of the army and navy departments where, year after year, with apparently inexhaustible patience, our military and naval experts have striven, before a seemingly indifferent Government, to demonstrate this vital weakness in our national defense.

"Is it because we do not know how to construct them or knowing how have not the facilities for manufacture? Most of us, I think, still remember with a just pride that the combined brains of the Wright Brothers, Americans, made the first aeroplane possible.

"In this country at present there are at least a dozen aeroplane constructors who manufacture standard aeroplanes. More than 30 concerns manufacture and develop aeroplane motors.

"In addition to these, there are scores of makers and dealers of propellers, magnetos, radiators, stabilizers, fabrics and scientific instruments necessary to the art of flying. Evidently it is not a question of supply. It is, then, a question of demand. For a reason for this lack of foresight, we are forced to look to a Government, the policy of which up to the present time has been most lax in its plans for the future, most slow to adopt the implements of proven value and most niggardly in its appropriations thereof.

"I am pleased to say, however, that President Wilson seems to be taking a favorable view of this question at present. As stated before, this matter is not a new one with me. Most of you will recall that about three years ago when I was notified of my selection to be your candidate for representative in this district, in my speech of acceptance, I made this statement:

"With regard to the army and navy, while favoring peace with honor at all times, I am and shall favor a navy of sufficient strength and efficiency to meet on the high seas the navy of any country in the world, and be able to defeat it. I believe that a navy of this sort means continual peace in this country and is worth the price it costs. I believe in keeping our army in the highest possible state of efficiency, but I cannot make myself believe that it is necessary to increase its strength over that which it represents to-day."

"My friends, do not overlook the fact that this statement was made three years ago. Since then things have changed, and later on, some time in February of this year, in a speech which I made in the city of Little Falls at the banquet of the merchants and manufacturers, I had this to say on this same question:

"I am prepared to support the general staff and war col-

lege of the army and the general board of the navy. If we find that we have not progressed as we should in the science and practice of war, let us ask them to recommend for us a definite and fixed policy that will, in the shortest practicable time, make us as efficient in war as we have been in the callings of peace."

"On the 27th day of August of this year, Henry A. Wise Wood, chairman of the conference committee on national preparedness, representing some nine different societies, representing many hundred thousands of members, in a speech before the convention of governors in the city of Boston being held at that time, made this remark with regard to this question of preparedness: 'In this emergency, we need no new men. We need few, if any, new plans. But we need to resurrect from their dusty graves the recommendations of our general staff and our naval board, and breathe into them life. Then and then only may we again go about our affairs with our ability to resist successfully the attack of any nation, however suddenly it may come upon us. And be able to resist is all we ask. But the ability to do it and nothing less, we believe we are entitled to demand at the hands of our Government. And for your aid in this patriotic work we beg with all earnestness of men who believe their country to be in jeopardy.' In closing these remarks, I cannot make any stronger plea to you than that. If you believe as I do in this matter, I ask you to support and sustain me in my efforts to help bring about a state of preparedness in this country. That will make it impossible for any country in the world to attack us successfully, to the end that we may retain our dignity and self-respect."

### Aero Club of America

(Editorial in Fall River, Mass., Herald.)

WAR has been revolutionized by the flying men. Tactics that were successfully employed on land and sea in previous wars are now obsolete because of these new "eyes" of the armies and navies. The conflict now in progress in Europe has demonstrated the practicability and great value of air fleets. What has the United States done to keep pace with the rapid progress in aerial navigation? Very little. In a letter to be read at the unveiling of symbolic tablets at the celebration of aerial navigation day at the Panama-Pacific Exposition, the governors of the Aero Club of America point out our shortcoming in this direction in this significant paragraph: "At this time, when the European war brings daily demonstrations of the potentiality of the aircraft, we realize the necessity of providing our army, navy and militia with aeroplanes. The United States, the birthplace of flight; the country that gave to the world the first flying boat, is last in aeronautics—behind all the first and second class powers and their colonies—very much behind Japan, China, Switzerland and Morocco." This is not a pleasant condition to contemplate. It means that, if war should come, we would be at a great disadvantage at the very outset, and it means, too, that we have not sought to develop, with characteristic Yankee enterprise, the broad possibility of aerial navigation in peaceful pursuits. The Aero Club of America is striving to overcome this lethargy and to arouse the government officials and the people here to a greater interest in aeronautics. It is a valuable work and the club should receive encouragement on every hand. The development of man's conquest of the air has been little short of marvelous. It was less than seven years ago that Wilbur Wright amazed the world by keeping a heavier-than-air machine thirty feet off the earth for two minutes. Today the duration record is over twenty-four hours and an aeroplane has been driven to the dizzy height of 24,246 feet. With such achievements in so short a time, it is only reasonable to expect that aerial transportation on a practical and paying basis will be an accomplished fact in a comparatively short time. Shall the United States be a laggard and permit others to be the first to reap the fruits of the work which it so splendidly began?



# THE NEWS OF THE WEEK

## Flew from Atlantic City to New York

D. K. Jaquith, the aviator who last winter made some long distance flights in Florida and who is now conducting an aviation school in Atlantic City, on September 23d made a flight to New York City with George L. Larrabee, of Philadelphia, one of his pupils. They stepped into a Curtiss flying boat in front of the Atlantic City hangars in the morning and two hours later they landed, without mishap, at the Columbia Yacht Club pier at the foot of Eighty-sixth street. The start was made at 12:30 o'clock and an hour later they landed on the beach at Seaside Park, where they took gasoline. At 3 o'clock they left for New York and to avoid cross winds that made navigation near the earth dangerous they ascended to a height of 5,000 feet as they passed over Governor's Island and Brooklyn. At that height the cold was so severe that for a brief space it appeared that they would be obliged to descend to thaw out their hands.

The journey was made in a 90-100 Curtiss and most of the trip was at the rate of 65 miles an hour.

## Army Fliers Make Fifteen Loops in San Diego Flights

Sergeant William Ocher and Corporal Albert Smith, attached to the United States Army Aviation Corps at North Island, San Diego, on September 24th made fifteen loops each while engaged in flights which were said to shatter all Army and Navy aviation records. Both officers used the same machine, equipped with a 90 horsepower motor. This machine is of the heavy army type, designed solely for long distance flying.

## Obliged to Land on Trip from Toronto

A new model hydroaeroplane, built at the Curtiss plant in Toronto, was recently taken out by Pilot McCauley and a student in an attempt to make two continuous trips over Lake Ontario from the Canadian to the American shore without landing. The hydroaeroplane was obliged, however, to descend near Kandall, N. Y., after crossing the lake on the first leg to the trip, on account of engine trouble, and the second lap of the proposed trip to break the world's record for continuous overwater flight was abandoned and another attempt will be made later. Other entrants are arranging to try for a new record over this same course.

## Burgess Company Has Foreign Orders

There is great activity at the aeroplane plant of the Burgess Company at Marblehead, Mass. A large force of skilled men is employed, and it is understood in Marblehead that three aeroplanes a week are being turned out for Holland. A. G. Mees, of Amsterdam, Holland, has been a guest at Hotel Rock-Mere, Marblehead, for a fortnight. M. Edgerton, of London, England, has also been a recent visitor at the Marblehead plant.

## Over 1,000 Men Are Enrolled

The British Aviation School, operated in connection with the Curtiss plant at Toronto, will soon, it is said, be turning out thirty aviators a week. The statement has been made that over 1,000 men have enrolled for instruction in the school with the ultimate object of getting to England and there obtaining a commission in either the army or the navy. Tony Jannus, Steve McGordon, Bert Acosta, Victor Carlstrom, Victor Vernon, Guy Gilpatrick and Theodore Macauley are instructors in this school. The volunteers must be British subjects. They are first required to pay the Curtiss Company a tuition fee of \$400, which is refunded by the British Government as soon as the candidate qualifies under the British Standards. An apt pupil qualifies in four weeks.

## Mr. Harry B. Wise Back From Europe

Mr. Harry B. Wise, the Business Manager of The Aeromarine Plane and Motor Co., recently returned from an extended visit to England. He had several important interviews with the Naval and Admiralty authorities and has shipped several motors to be tested at the Royal Aircraft Factory. He was greatly impressed by the tremendous activity in aeronautical circles in Britain, and returns enthusiastic over the possibilities of American products in the English and French markets.

## Curtiss Flying Boat on Exhibition

With the hope of stimulating a further interest in aeronautics among amateurs and familiarizing the general public with the possibilities and value of aircraft as an arm of defense, Mr. Glenn H. Curtiss has sent a flying boat to New York for exhibition purposes.

Through the courtesy of the Packard Motor Car Company the use of its showrooms at Broadway and Sixty-first street has been granted for the exhibition. An experienced aviator is in charge to explain the construction of the flying boat its uses and manner of operation. The machine exhibited is designed to carry two passengers and a pilot. It is equipped with a 90 horsepower motor, has a water speed of sixty miles and an air speed range from forty-five to seventy-five miles an hour and is of single-step hydroplane construction.

## Senator's Wife Makes a Flight

Mrs. W. T. Stevens, wife of Senator Stevens, of Wisconsin, is probably the first woman to make an aerial flight in northern Wisconsin. While visiting the State Forestry headquarters at Trout Lake with her husband and members of the conservation commission she was taken up with Aviator L. A. Vilas, who has been using the plane to detect forest fires.

The immense area that can be covered by use of an aeroplane, the enormous sums that its use will save by enabling forest rangers to detect and extinguish forest fires at their outbreak, should lead to the early adoption of aeroplanes in this service in all parts of the country.

Curtiss Flying Boat of the type now being exhibited at the Packard Motor Car Showrooms in New York City.







Walter Johnson, who is now representing the Curtiss Aeroplane Company in Russia.

#### A New Curtiss Building in Buffalo

The enormous growth of the Curtiss Aeroplane Co. has necessitated the construction of an additional shop at the company's plant in Buffalo. Contracts have been signed for the construction of a building 50 feet high and 400 feet long on Churchill street, adjacent to the plant. Glenn H. Curtiss announces his intention of making Buffalo the headquarters of the company.

#### J. B. R. Verplanck Makes 90-Mile Hydro Trip

J. B. R. Verplanck made a trip from Fishkill-on-Hudson, to Great Neck, L. I., on Sunday last, covering the distance of ninety miles in less than two hours. Verplanck flies a Curtiss flying boat, one of the first that was built. He won the Chicago-to-Detroit prize with it in 1913, and since that time has made it answer every purpose, from business trips to pleasure flights. He contends that one can get more use and greater pleasure out of a flying boat than from any other sport. He asserts that his machine cost him exactly \$2 for repairs last year.

The trip down Sunday was made with a mechanic. Verplanck said it was one of the roughest trips he ever made because of the gusty atmospheric conditions. He followed the river all the way down, rounding the Battery and proceeding up the East River to the Sound.

#### Military Aviation News

Lieutenants Clarence C. Culver, Third Cavalry; Harrison H. C. Richards, Fourth Cavalry, Sumner Waite, Fifth Infantry, and Roy S. Brown, First Cavalry, have recently reported for duty at the Signal Corps Aviation School.

Lieutenants John F. Curry, Fifth Infantry; Bert H. Atkinson, Fifteenth Infantry; Harold S. Martin, Fifteenth Infantry, and Jack W. Heard, Fourteenth Cavalry, have been ordered to report for duty as aviation students at the Signal Corps Aviation School.

Mr. George B. Fuller, Aeronautical Mechanical Engineer, Signal Service at Large, has just returned from an inspection of the Hall-Scott Motor Car Company's factory at Oakland, Cal., and of the new six-cylinder Hall-Scott aeronautical motor.

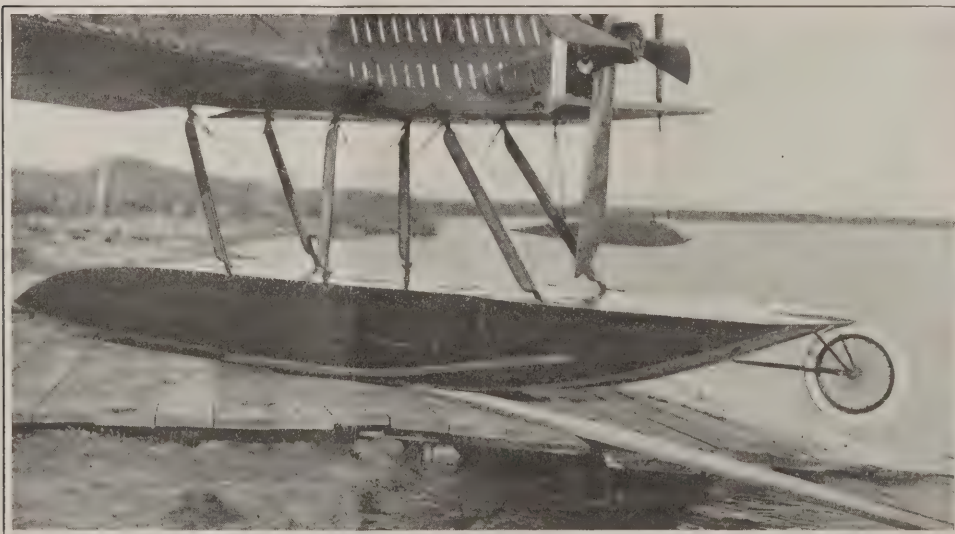
Colonel Lvov, of the Russian Field Artillery, visited the Signal Corps Aviation School on an inspection tour. He has been traveling through the West buying all forms of machinery for the use of the Russian Government in the present war.

An extensive test of lubricating oils, covering a period of one year, has just been completed at the Signal Corps Aviation School.

On September 6th and 9th Miss Tiny Broadwick made double parachute drops from a height of about 3,000 feet at the San Diego Exposition. Starting from an aeroplane she dropped in one parachute a distance of approximately 800 feet. This first parachute was then cast off and she dropped about 500 feet when the second parachute opened and lowered her gently to the ground.

A number of aviators at the Signal Corps Aviation School have recently made cross-country flights to various points of interest between San Diego and Los Angeles. On a number of these cross-country flights landings have been made in very bad territory in order to repair some portion of the power plant. All repairs were made by the pilots, thus illustrating the thoroughness of the system of instruction at the Signal Corps Aviation School. Each aviation student is required to be under instruction, both theoretical and practical, on the subjects of aeroplanes and motors. For example, the class in motors is under personal and individual instruction at all times. A certain motor is turned over to this class and the aviation students must take it down, overhaul it thoroughly and put it together. It is then put on the block and tested. Finally the students must pass a theoretical and practical examination on motors. The last portion of the course in motor instruction consists of extensive practical work in trouble shooting. The instructor, when the class is not looking, tampers with the motor. The class then starts the motor and must shoot the trouble. This is carried on until each student has individually had sufficient practice to demonstrate his ability to shoot trouble in the field. The instruction in aeroplanes is under the same system. Certain aeroplanes are turned over for the purpose of instructing the aviation students. The class must take these all to pieces and set them up and properly align them again. New surfaces are made and covered, and in general the class must do everything that is to be done with respect to the building of an aeroplane.

The course for aviation students includes sufficient instruction to insure that each student officer can make fittings and perform any other kind of metal work that is liable to arise at any time in the field.



The new Glenn L. Martin hydroaeroplane equipped with wheel to facilitate descent on land.



The theoretical course in aeroplanes embraces instruction such as to fit student officers to become inspectors for the construction of aeroplanes.

The course in meteorology and navigation of the air is sufficient to insure a working knowledge of both of these subjects.

Finally, at the close of the course, which is supposed to extend over a period of five months, there are practical and theoretical examinations of each student officer for the purpose of ascertaining his fitness for the rating of junior military aviator.

#### McGee Flying in Michigan

Don McGee, of Saginaw, Mich., who has been making exhibition flights in that State, has closed a contract to make daily flights during the Saginaw County Fair.

#### Cigarettes from the Sky

Themelis Bros, of New York City, manufacturers of "Rose Tip" cigarettes, did a new stunt in advertising tobaccos when their Atlantic City representative, J. B. Back, from a hydro-aeroplane dropped from the sky boxes of cigarettes on the famous boardwalk just when the crowds were thronging it. Of course, the novelty immediately put the name of the cigarette on everybody's lips, giving it an introduction whose commercial value, while impossible to estimate, must be very great.

#### California News

The biplane now under construction at the Christofferson Aircraft Co. for Charlie Niles will soon be completed. Niles will fly this machine at the exposition and later in the Orient.

Silvio Pettirossi continues to draw large crowds to the exposition with his original style of flying. Niles and Pettirossi give a show far better than we had ever expected to see, and Niles' 3,000-foot drop to within fifty feet of the buildings at the fair is a sensation we are not soon to forget.

Harry Christofferson is still keeping up his phenomenal reputation as a safe and sane aviator, carrying daily from ten to forty passengers.

Lansing K. Tevis left for New York this week on business for the Christofferson Aircraft Mfg. Co. Mr. Tevis is a member of the company.

Allen and Malcolm Loucheed are busy daily at the exposition, carrying passengers with their hydroaeroplane.

Silas Christofferson is negotiating, in Oakland, for a large tract of land, and will open an aerodrome, where flying will be done daily, and meets held on Saturdays and Sundays. This will be on the same plan as Hendon, England, aerodrome. Mr. Christofferson expects to make it so attractive that aviators from all over the country will be seen here the year around.

#### C. Ray Benedict Closes Season at Cedar Point

C. Ray Benedict, chief aviator for the Lorain (Ohio) Hydro and Aerial Company, has closed the season at Cedar Point, where he has been giving daily exhibitions and has returned to the headquarters at Lorain. The homeward trip from Cedar Point was made in the "Lorain," the thirty miles being covered in 26 minutes.



Elling O. Weeks, of Eagle Grove, Iowa.

Mr. Benedict also made a second trip between the two points, as the company took the delivery of a second Benoist Boat while in Cedar Point.

During the season Mr. Benedict has made 385 passenger-carrying flights. Then in Lorain he took up the work of instructing three students—Mr. Robert Watts, of Detroit; Kyle Smith, of Wheeling, W. Va.; Mr. J. E. Pepin, the President of the Lorain Hydro and Aero Co.

Lorain is again the permanent home of the company and flights are to be made daily from the beach, at the reduced rate of \$5 per trip for home folks.

The new Thomas aeronautical motor has received its initial tryout, which proved to be thoroughly satisfactory.

#### Puget Sound Aerial News

By ROBERT LA TOUR

T. T. Maroney is back from his trip to Montana and Oregon and again has his outfit at Lake Washington. He has sold his flying boat to parties in Bellingham and intends to construct another soon. His flying now will be confined principally to the small Curtiss hydro.

The Hamilton Aero Mfg. Co., of Seattle, owing to the big demand for their aeroplanes, have been forced to enlarge their plant, but as an available location could not be obtained near their present site, they have established another factory at Vancouver, B. C. Their new location brings them into closer touch with their Canadian trade. The force at the Seattle branch has been increased to rush out the machines now under construction.

Aviator Gustav Stremmer, of Tacoma, is working on the designs for a new passenger-carrying flying boat, which he will construct this winter.

Munter is still filling his exhibition dates in Montana and Idaho, but expects to be back in Seattle next month.

Robert E. Lee is building a Curtiss pusher type equipped with a maximotor.



Capt. M. A. Guyle, Co. D., Iowa National Guard, and William C. Robinson at the start of a flight in a machine constructed by the Grinnell Aeroplane Company.



## COMPETITION FOR THE CURTISS MARINE FLYING TROPHY

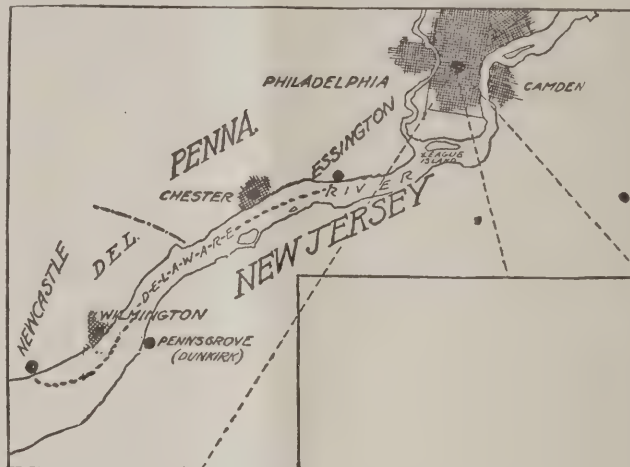
THE distinction of being the first to compete for the Curtiss Marine Flying Trophy goes to Mr. Robert E. Glendinning, the Philadelphia banker and sportsman, and as he represented the Aero Club of Pennsylvania, the club becomes the first holder of the trophy. Incidentally, Mr. Glendinning made the longest flight ever recorded in the State of Delaware.

Mr. Glendinning made 160 miles on September 20th, covering a course between Essington and New Castle, Del., a round trip of 40 miles. Mr. Glendinning went into the air at 8:46 A. M. and flew twice to New Castle and return. In the afternoon he made two more trips, stopping for the day at 3:56 P. M. Though he was satisfied with a total of 160 miles, the contestant's record was lowered on account of unfavorable weather conditions and the need of slight adjustments to the engine.

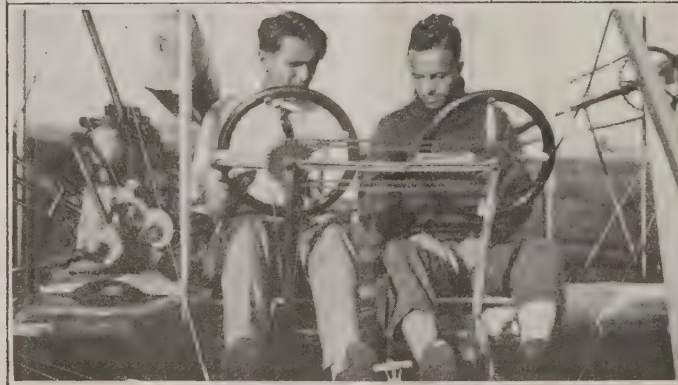
When he went up in the morning there was a dense fog, but he had not been in the air long before it lifted. After completing two laps of the course between the two towns, Mr. Glendinning found that he could not rise because so much water had collected in the boat. She was accordingly beached and drained after a delay of about an hour. Meanwhile a mist had settled down which caused a little more delay, he finally getting away on the first of the afternoon flights at 2:20 P. M., finishing the first lap at 3 o'clock and the second at 3:56, when he concluded his efforts for the day.

The trophy, valued at \$5,000, was offered by Glenn H. Curtiss to the man who made the longest flight in a hydroaeroplane

in ten consecutive hours. The flights were scheduled to begin July 4th and end October 31st. No other aviator has competed for the trophy. To hold it permanently it must be won three times.



The Route Traversed by Mr. Glendinning.



ACTIVITIES OF THE WRIGHT SCHOOL.

The Wright School at Dayton is experiencing the most active period of its history. Instructors Rhinehart and Wright (no relation of the Wright Brothers) have their hands more than full with students from New York, Pennsylvania, Ontario, British Columbia and other sections of Canada. In the illustrations above are shown various personalities of the school. Top, left hand, E. P. Beckwith of New York. Top, right hand, Harry Swan, New York. Top, centre, a Wright machine returning after a flight. Bottom, left hand, instructor explaining principle of dual control to student. Bottom, right hand, Instructor Rhinehart telling pupils how machine should be operated.





# FOREIGN NEWS



## AUSTRALIA

The Federal Executive Council of Australia has approved the formation of two "half-flights" of aeroplanes for the Australian militia—a "half-flight" consists of two officers and twenty men. The tuition will be carried out at Point Cook.

## FRANCE

The French monoplane, E. X. Demars, has equaled the world's altitude record of 21,598 feet, established by the German aviator, Otto Linnekogel, in a flight in an aeroplane at Johannisthal in July, 1914.

French aviators on September 22 bombarded Stuttgart, capital of the Kingdom of Württemberg, according to an official bulletin, which says: "In retaliation for the bombardments by the Germans of open towns and civilian population of France and England, a group of aeroplanes set out this morning to bombard Stuttgart, the capital of Württemberg. About a hundred shells were dropped on the royal palace, and the station. Our aeroplanes, which cannonaded different points along the line, returned in safety to their base." Stuttgart is a city of 300,000 inhabitants, and the headquarters, in peace times, of the Thirteenth Army Corps. Architecturally it is one of the most attractive cities in Germany, though most of its buildings are modern.

According to a despatch from Paris, many persons in the parks of that city searched the skies in vain today for an aeroplane which they could hear distinctly but could not see. Some shaded their eyes with hats and others stood in the shadow and gazed at the almost cloudless sky in the direction from which came the motor's buzzing, believing that at any moment an aeroplane would appear from behind some one of the tiny patches of clouds in the blue. At the end of a quarter of an hour the noise of the motor grew fainter in the distance and then ceased. Nobody saw the aeroplane, because it was one of the new French invisible machines, which cannot be seen even at remarkably low altitudes at certain hours on clear, sunny days.

During the week flotillas of French aeroplanes have bombarded the railway stations at Offenburg, Conflans and Vouziers, as well as enemy cantonments at Langemarck and Middelkerke. The aeroplanes also compelled several of the enemy's captive balloons to descend hastily.

On September 21 nineteen French aeroplanes bombarded the railway junction at Bonsor, east of Morkenze. A hundred bombs were dropped and much damage done.

The thrilling story of an Australian air pilot who was strung by one hand to the framework of a disabled aeroplane 5,000 feet over the enemy's lines while executing repairs with the other, was told by an officer observer from Northern France.

"We had crossed the German lines and their guns were booming at us from way down below when Cornstock (the pilot) noticed our left wing was tilting down and not responding to the controls," said the officer. "He swung out of the seat to the right side, but the plane continued to tilt, and it looked as if we were going over sure."

"Cornstock let himself down with nothing but thousands of feet beneath him, holding tight with his right hand and fumbling with the control wires where they were jammed under the body of the machine."

"The strain on his right arm must have been terrific. Seconds seemed hours as he swayed there, his legs dangling in space while the machine swung over 'air bumps' and levered to the side. As a matter of fact, it was all done in an instant. He was back in his seat cool as ever."

Twenty-one air fights have taken place over the German lines during the last week, according to Field Marshal Sir John French's official report. He says:

"Three hostile aeroplanes have been brought down in the last four days. Two, hit by our anti-aircraft guns, fell within the German lines. A third, shot down by one of our pilots, fell in our lines. The machine was slightly damaged; the pilot and observer were killed."

"On September 10 our artillery, assisted by aeroplane direction, bombarded two German observation balloons east of Ypres. One balloon burst and the second was deflated and removed."

## GERMANY

An interview with a German engineer-aviator published in Copenhagen gives an account of experiments in Germany with new giant aeroplanes which the Germans hope will supersede the Zeppelins. The idea of con-

structing them is said to have arisen from the examination of a large Russian machine shot down in East Prussia some time ago, and now at the aeroplane factory at Gotha. The machines are said to be biplanes measuring about 140 feet across the wings and they will have 300 h.p. motors, with three propellers each. They will be capable of carrying sufficient gasoline for eight hours, they will have wireless apparatus and searchlights, and will be able to go to London and back in five hours.

## GREAT BRITAIN

Forty aeroplane fights in eighteen days is the record of the Royal Flying Corps with the British army in the field. During the first three weeks in September four enemy aeroplanes are known to have been destroyed, at least seven others sent hurriedly to earth and believed to have been destroyed, and all survivors were chased ignominiously into their own country.

One pilot had five fights in one morning. He beat off first four German machines that came up to grapple with him, one after the other, but when the fifth bore down on him he had exhausted all his machine gun and revolver ammunition. The noise of the engines drowns the report of a revolver and the German pilot who saw him go through the motions of aiming and firing did not realize that the weapon was useless. The German fired twenty or thirty rounds and then gave it up. The British aviator finished his reconnaissance in peace and came back to lunch.

Eight biplanes have been presented to the British government by overseas clubs. Three of them are from Montreal, Nova Scotia and St. Catharines, Ontario.

According to reports from Berlin, the Bank of England was hit by Zeppelin bombs during the last air raid on London.

Passengers on the Orduna, which arrived in New York last week, said that St. Paul's Cathedral had the narrowest escape of any of the famous edifices. Many of the bombs fell within a few hundred yards of the historic structure, and one set fire to a wool storehouse on Wood street, near by. The flames from this conflagration led to the belief that St. Paul's itself was burning, and the crowds began to pour in from every direction to see the blaze.

On this raid Londoners were treated to their first opportunity to actually see the Zeppelins in battle. There had been other raids, even one the previous night, but hitherto they had been forced to content themselves with the noise of whirring propellers and the flashes of the falling bombs as the monsters passed unseen in the darkness. But the crowds that watched that night saw the whole scene as though it had been staged for them.

A score of searchlights from the buildings about focussed on the Zeppelin in a blinding glare, partly to pick out the target distinctly for the defending guns and partly to blind the marksmen above. The huge balloon seemed to hang stationary in the sky. Under it were tiny balls of cotton where the shrapnel was bursting. Within a few minutes a corps of aeroplanes began circling about and over and under the German invader, trying to get at a vital spot with their rapid fire guns. Once the Zeppelin seemed to have been struck. It dropped and fluttered, then rose again to a higher point. The defending guns were ineffectual, it was agreed. The shrapnel did not come near the balloons at their great altitude, but burst far below.

## INDIA

The Junagarh Durbar has presented three armed aeroplanes to the Imperial Government, and the Maharaja of Rewa a second aeroplane.

The aeroplanes used by the Commonwealth aviation corps in India are of the Maurice-Farman biplane type. They are doing observation service over the Turkish positions with excellent results.

## ITALY

A Vicenza dispatch to the Corriere della Sera, Milan, says: "On the national fete day (the anniversary of the occupation of Rome by Italian troops) Gabriele d'Annunzio flew over Trent in an aeroplane and dropped little bags made of the Italian colors and containing a message written by the poet in patriotic style telling the truth about military operations and exhorting the people of the city to await patiently the arrival of the army of freedom. The message was dated: 'From the Sky of the Fatherland, September 20.' An Austrian official statement regarding the incident, said: 'A hostile biplane threw upon Trent some very ingenious pamphlets by Lieutenant Gabriele d'Annunzio.'"

One of the new speedy German Biplanes, which has a most efficient climbing capacity.





# THE RIGID DYNAMICS OF CIRCLING FLIGHT

The Third Wilbur Wright Memorial Lecture Delivered  
before The Aeronautical Society of Great Britain.

By Prof. G. H. Bryan, Sc. D., F. R. S.

## INTRODUCTION.

This paper is intended as a sequel to "Stability in Aviation" and deals with Problem 2 in Chapter XI. (p. 178). The long list of problems there given will show that before the book was written or even commenced, investigations had been projected and contemplated more than sufficient to fill a second volume on the Rigid Dynamics of Aeroplane Motions, my book on stability constituting the first. It will be found that the necessity of mathematical investigation in connection with stability and other aeroplane problems was first mentioned by me in "Science Progress" for October, 1897, and it would have been a great advantage if the completion of most of this work had preceded the first aeroplane flights. With reasonable facilities and assistance, longitudinal stability could have been completed by about 1900, lateral by 1904; the unwritten second volume would have been in the printers' hands by January, 1910. It has, however, been impossible to obtain the necessary facilities for the continuous pursuit of work of this kind consistently with due performance of the duties required in a department of a University College. Even if a class is placed in the hands of an assistant lecturer

and a large percentage of students fail, the trouble thus caused may involve the loss of a whole year in carrying on such calculations, as it is very difficult to go on with the heavier work unless continuous time can be given to it without any anxiety regarding the smooth working of one's professional duties. Serious obstacles have also been placed in the way of carrying out this work in other quarters, in several cases for no reason whatever. The encouragement which this work has received from the Aeronautical Society induced me to make an effort to undertake the present investigation, and thus to clear up unknown mysteries and to solve riddles which had puzzled me for a long time.

The problem of lateral steering was first considered by Reissner in 1910 (Zeitschrift für Flugtechnik und Motorluftschiffahrt, 1910. p. 103), and it was again considered as a particular case of neutral equilibrium in a thesis by Dr. Karl Gehlen on Stability which was published soon after my book.\*

This research took the form of a dissertation for the D.E. degree in Dr. Reissner's department at the Aachen Technical College.

Our methods were to a large extent identical, but Reissner's pupil performed calculations for actual aeroplanes, while it has been quite impossible for me to attempt anything of the kind at the time my book was published or indeed subsequently. As Dr. Gehlen's thesis is thus mainly occupied with stability the references to circular motion are very brief.

A German edition of "Stability in Aviation" was prepared by Dr. H. G. Bader (Berlin: Julius Springer, 1914). A paper on automatic rudders has been published recently by Crocco, but it is of little importance and the portions relating to stability are incorrect for reasons explained on p. 176 of my book.

In the following paper the notation, nomenclature, results and formulae of "Stability in Aviation" will be freely used and referred to, as it would be impossible to give an independent treatment of this subject without re-writing a large amount of what has already been written. It is thus unfortunately necessary in this instance to follow the practice of many writers of mathematical papers who commence by quoting an obscure formula that has been published in an obscure journal, with the result that busy people cannot be at the trouble of reading their papers.

It is unnecessary to repeat much of what has been said in my "Introduction and Summary." As "deductions of conclusions from definite stated hypotheses," the present results are based on the following assumptions

1. That the systems considered consist of "narrow planes gliding at small angles" so that the air pressure on every surface-element obeys the sine law.
2. That if  $U_0$  is the velocity in steady rectilinear flight, the additional velocity components in circular flight are small in comparison with  $U_0$ , so that the additional forces and couples can be expressed as linear functions of the "resistance derivatives" as in §§ 16, 17.

This assumption was perfectly legitimate when applied to the small oscillations discussed in "Stability." As applied to circular motion it will of course hold good, as an approximation, only in cases where the radius of the circular path is large compared with the linear dimensions of the machine. It also requires that the distance of the "turning point" from the centre of gravity should be small in comparison with the radius of the path. There are some systems in which this does not appear to be the case in the following investigation, but the systems in which these conditions occur appear to be undesirable.

I think it is probably possible to replace the present equations by more exact equations not involving the use of resistance derivatives and therefore better suited to the problem of steady motion in circles of small radius. In view of my limited opportunities for this work it would have been impossible to make any such attempt here. It is to be anticipated that the formulae will prove to be more complicated.

3. It will be seen that in general the six equations of motion, longitudinal and lateral, are mutually interdependent, whereas we have in general confined our attention to satisfying the conditions of lateral equilibrium. In such cases it is to be anticipated from general considerations that the neglected conditions only produce small changes in the components of motion under consideration, but here again is a subject for further investigation.

It must be remembered, however, that it is often better to obtain roughly approximate formulae which are capable of simple interpretation than to aim at greater accuracy and deduce a result which is not readily intelligible.

On the whole I should expect to find a fairly close qualitative agreement between the present conclusions and the results of experiment or practice, but of course differences of a quantitative character in the actual numerical working details must be expected.

One of the main objects of this investigation is to ascertain the conditions which render it easiest to steer an aeroplane in a horizontal circle of any radius that is not too small, and I have introduced the idea of "inherent controllability" to denote the property which a system may possess of freely describing a circular path without any pressure on the controlling rudders. In such cases the rudders will act as guides by preventing the aeroplane from leaving the chosen path, and as the system without them must, from the nature of the case, be wanting in asymmetric or lateral stability it is necessary for the working of such a system that the addition of the rudders should render it stable. The conditions for this must be worked out by the methods described in my book.

Inherent controllability is thus practically equivalent to asymmetrically neutral equilibrium as applied to the system minus the rudder, and it is determined by the condition that one root of the period equation for small lateral oscillations must vanish. It would of course be possible to avoid introducing a new term for this particular condition, but I think the distinction is convenient as the importance of the condition must necessarily be mainly in applications to the problem of control.

It will be found that there are several different ways of obtaining inherent controllability and that in circling flight the system turns about a point which in some cases is in front and in some cases behind the centre of gravity. The axis of  $x$  or horizontal line through the centre of gravity in the direction of forward motion thus envelopes a circle of radius,  $a$ , the "turning point" being the point of contact of the axis tangent with its envelope, and the lateral or sideways velocity of the aeroplane being proportional to the distance of the centre of gravity from the turning point. This length and the inclination of the aeroplane to the vertical constitute two independent variables which can be so chosen as to satisfy two conditions of lateral equilibrium, but as there are three, a third variable is in general required, and if a rudder plane is used, this latter variable may be taken to be the pressure on that plane. The condition for inherent controllability is that the three equations of lateral equilibrium should satisfy some further identical relation by which the number of variables is reduced to two, and there are several ways in which this may be done.

The results which are summarised at the end lead to some interesting conclusions which were quite unexpected when I commenced writing the paper. In particular, they show the differences in behaviour between wings that are bent up and down respectively, the advantages, under certain circumstances, of curved wings as contrasted with plane wings bent into a simple dihedral angle, and generally that the form and curvature of the wing areas may play a much more important part in circling flight than I had anticipated. Indeed, it is fortunate that I have never expressed any opinion in discussions on this subject as it is now fairly certain that such an opinion would have been wrong.

The applications to the flight of birds are obvious and suggest much interesting material for discussion. At any rate a good many peculiarities in the wing structure of the circling birds appear to admit of interpretation on dynamical principles.

With regard to the possible application of these results to actual aeroplanes, it remains to be seen how far it is desirable or practicable to realise the conditions of inherent controllability in a real flying machine. But I cannot help thinking that a study of the present work, followed by a few experiments, will either lead to improvements in the steering of aeroplanes, or if the present arrangements are the best, it will now be easier to understand the reason why.

I have said very little about the use of ailerons in this paper, as I think it more desirable to ascertain what can be done without them. Their effects are after all much more easily studied than some of the problems here considered, and there is therefore less reason for my taking this matter up. In any case control by means of ailerons does not come within the province of problems on inherent controllability.

## CHAPTER I.

### Fundamental Principles.

1. Let the plane of symmetry of the aeroplane meet the horizontal plane through its centre of gravity  $G$  in the line  $Gx$ . Let  $OI$  be the vertical axis about which the aeroplane is turning,  $O$  being the centre of the circle which it is describing. Let  $OM$ , the perpendicular distance of  $O$  from  $Gx$  be equal to  $a$ , and let  $GM = c$  so that the aeroplane is turning about a point in front of its centre of gravity by an amount  $c$ . Then if we take  $Gx$  and parallels through  $G$  to  $IO$ ,  $OM$  as axes and suppose  $\Omega$  to be the angular velocity about  $OI$ , the component velocities of  $G$  will be

$$\Omega a, \quad 0, \quad \Omega c$$

while the component angular velocities will be

$$0 \quad \Omega \quad 0.$$

### I.—GENERAL EQUATIONS.

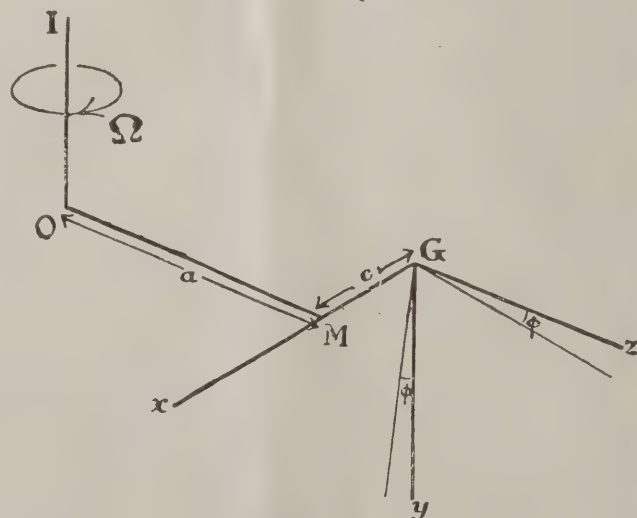


FIG. 1.



The aeroplane will however heel over through some angle  $\phi$ , and we must therefore refer its motion to axes of  $y$  and  $z$  making angles  $\phi$  with the vertical and horizontal respectively. The components of linear and angular velocity now become

$$\begin{aligned} u &= a\Omega, & v &= c\Omega \sin \phi, & w &= c\Omega \cos \phi \\ p &= 0, & q &= \Omega \cos \phi, & r &= -\Omega \sin \phi \end{aligned} \quad (1)$$

Substituting in the equations of motion of page 23, §15, we obtain (with  $\theta = 0$ )

#### Longitudinal Group.

$$W \frac{c\Omega^2}{g} = H - X \quad (2u)$$

$$-W \frac{a\Omega^2 \sin \phi}{g} = W \cos \phi - Y \quad (2v)$$

$$F \frac{\Omega^2 \cos^2 \phi}{g} = -Hh - N \quad (2r)$$

#### Lateral Group.

$$-W \frac{\Omega^2 \cos \phi}{g} = -Z - W \sin \phi \quad (2w)$$

$$(B - C) \frac{\Omega^2 \sin \phi \cos \phi}{g} = -L \quad (2p)$$

$$F \frac{\Omega^2 \sin \phi \cos \phi}{g} = -M \quad (2q)$$

In these equations  $a\Omega$  represents the velocity of the aeroplane in the forward direction, but the resultant velocity is  $\Omega \sqrt{a^2 + c^2}$  and the radius of the circular path is  $\sqrt{a^2 + c^2}$ .

Equations (2u, v, r) show that the conditions of longitudinal equilibrium are affected by the circling motion and are not the same as in rectilinear motion. The differences can evidently be compensated for by tilting the aeroplane about the axis of  $z$ , by changes in the velocity of propulsion and by manipulating the longitudinal rudder planes. The effect of tilting will be that the axis of  $x$  in the above equations will occupy a different position in the aeroplane to the direction of steady rectilinear motion. We may of course use equations (2) to discuss the conditions of lateral equilibrium on this understanding, but the moments of inertia and resistance derivatives will then have to be referred to the normal axes by means of the formulæ of transformation of Rigid Dynamics and three dimensional formulæ corresponding to those of p. 48, § 31

2. The alternative is to turn the axes round with the aeroplane through an angle  $\theta$ , which we take to be positive if the aeroplane is depressed in front; this convention being necessary in order that the translational and rotational displacements should be referred to a right-handed system of axes.

In this case we have for the components of

Linear Velocity.	Angular Velocity.	Gravity.
$u = \Omega (a \cos \theta + c \sin \theta \sin \phi)$	$p = \Omega \cos \phi \sin \theta$	$W \cos \phi \sin \theta$
$v = \Omega (-a \sin \theta + c \sin \theta \cos \phi)$	$q = \Omega \cos \phi \cos \theta$	$W \cos \phi \cos \theta$
$w = + \Omega c \cos \phi$	$r = -\Omega \sin \phi$	$-W \sin \phi$

(3)

The equations of equilibrium now assume the forms

#### Longitudinal Group.

$$W \frac{\Omega^2}{g} (c \cos \theta - a \sin \theta \sin \phi) = H - X + W \cos \phi \sin \theta \quad (4u)$$

$$W \frac{\Omega^2}{g} (-c \sin \theta - a \sin \theta \cos \phi) = -Y + W \cos \phi \cos \theta \quad (4v)$$

$$\frac{1}{2}(B - A) \sin \theta \cos \theta + F \frac{\Omega^2}{g} (\cos^2 \theta - \sin^2 \theta) \cos^2 \phi = -Hh - N \quad (4r)$$

#### Lateral Group.

$$W \frac{\Omega^2}{g} a \cos \phi = -Z - W \sin \phi \quad (4w)$$

$$\frac{1}{2}(B - C) \cos \theta - F \sin \theta \frac{\Omega^2}{g} \sin \phi \cos \phi = -L \quad (4p)$$

$$\frac{1}{2}(C - A) \sin \theta + F \cos \theta \frac{\Omega^2}{g} \sin \phi \cos \phi = -M \quad (4q)$$

These equations are, however, much less convenient than equations (2) and therefore we shall not use them.

3. An important object to be kept in view is the desirability of reducing as far as possible the stresses on any rudder planes that are remote from the main lifting planes of the machine. *Ailerons*, on the other hand, are of course attached to the strong framework carrying the main planes, and they may act not only directly, but to some extent indirectly by modifying the pressure on the parts of the main planes in their immediate neighbourhood. But in every case *inherent controllability*, as we may call it, is secured by making the resistances to circular motion small, and it may be desirable to see whether it is possible to make them vanish. The action of the rudder planes will then determine the character of the path. If these planes were removed the equilibrium of such an aeroplane would be asymmetrically or laterally neutral, but the rudder planes would maintain lateral stability and when these rudders were turned round the aeroplanes would describe a circular path in which the rudders would move tangentially, thus experiencing no resistance. It remains to be seen how far it is possible to approximate to these conditions.

4. In the following investigations we shall resort to approximate methods by assuming that the radius of the circular path is large compared with the dimensions of the machine, and that the forces and couples due to air resistance differ from those in steady motion by small quantities that may be represented in terms of the system of resistance derivatives. We employ the equations (2), in which the axis of  $z$  is horizontal and we will also write

$$a\Omega = U_0 + u$$

where  $U_0$  is the corresponding velocity in a standard state of steady rectilinear motion in the direction of the axis of  $x$  supposed to remain horizontal. We use the symbols  $X_1, Y_1, Z_1, L_1, M_1, N_1$  to denote the forces and couples which have to be impressed on the system by means of the rudder planes in order to maintain equilibrium in the circular path, these being the quantities which it is desired to make small or vanish. The component  $X_1$  would not be easy to produce by means of rudders, but it can easily be produced by a slight variation in the propeller thrust. Taking account of the conditions of equilibrium for rectilinear motion, viz.,  $H - X_0 = 0, W - Y_0 = 0, Hh - N_0 = 0$  we get

#### Longitudinal Group.

$$W \frac{c\Omega^2}{g} = -uX_1 - \Omega \sin \phi (cX_1 - X_1) - X_1 \quad (5u)$$

$$-W a \sin \phi \frac{\Omega^2}{g} + W (1 - \cos \phi) = -uY_1 - \Omega \sin \phi (cY_1 - Y_1) - Y_1 \quad (5v)$$

$$F \Omega^2 \cos^2 \phi / g = -uN_1 - \Omega \sin \phi (cN_1 - N_1) - N_1 \quad (5r)$$

#### Lateral Group.

$$-W \cos \phi \frac{a\Omega^2}{g} + W \sin \phi = -\Omega \cos \phi (bZ_1 + Z_1) - Z_1 \quad (5w)$$

$$(B - C) \sin \phi \cos \phi \frac{\Omega^2}{g} = -\Omega \cos \phi (bL_1 + L_1) - L_1 \quad (5p)$$

$$F \sin \phi \cos \phi \frac{\Omega^2}{g} = -\Omega \cos \phi (bM_1 + M_1) - M_1 \quad (5q)$$

If the propeller thrust passes through the centre of gravity  $N_0$  vanishes in (5r).

Where auxiliary surfaces are used for steering they are not to be included in the expressions for the resistance-derivatives, but their whole effects are to be included in the terms  $X_1 \dots M_1$ .

## CHAPTER II.

### Straight Planes and Vertical Rudders.

#### II.—STRAIGHT PLANES.

5. Here by § 77 the only resistance-derivatives which do not vanish are

$X_0 = 2KSU \sin^2 \alpha$	$X_1 = KSU \sin \alpha \cos \alpha$
$Y_0 = 2KSU \sin \alpha \cos^2 \alpha$	$Y_1 = KSU \cos^2 \alpha$
$[L_0 = KU \sin^2 \alpha]$	$L_1 = -2KU \sin \alpha \cos \alpha$
$[M_0 = -KU \sin \alpha \cos \alpha]$	$M_1 = 2KU \sin^2 \alpha$

or in the " $S^1\mu$ " notation

$X_0 = 2KS^1U\mu^2$	$X_1 = KSU\mu$
$Y_0 = 2KS^1U\mu$	$Y_1 = KS^1U$
$[L_0 = KU\mu^1]$	$L_1 = -2KU\mu^1\mu$
$[M_0 = -KU\mu^1\mu]$	$M_1 = 2KU\mu^1\mu^2$

of which  $L_0, M_0$  do not occur in our equations and are therefore enclosed in square brackets.

Commencing with equations (5r) and (5q) we see that these give, with  $U = a\Omega$ ,

$$N_1 = -F\Omega^2 \cos^2 \phi / g \quad (6r)$$

$$M_1 = -F\Omega^2 \sin \phi \cos \phi / g - 2KLa\Omega^2 \sin^2 \alpha \cos \phi \quad (6q)$$

and as  $\phi$  is in general a small angle, it is obviously best to make  $F = 0$  and  $N_1 = 0$  rather than to attempt to make  $M_1 = 0$ .

If  $k$  is the radius of gyration of the surface  $S$ , so that  $I = Sk^2$  we now get from the conditions of equilibrium

$$M_1 = -2W \tan \alpha \cos \phi / k^2 a \quad (7q)$$

for the couple about the axis of  $z$  due to the action of the rudders.

If the conditions  $Z_1 = 0, L_1 = 0$  are to be satisfied we must have

$$\tan \phi = a\Omega^2 / g = U^2 / ga \quad (6w)$$

$$(B - C) \sin \phi = 2aKl^1\mu g \quad (6p)$$

Equation (6w) represents the fact that the component of gravity along the axis of  $z$  balances the centrifugal force just as in the conical pendulum. (6p) represents the condition that what is sometimes called the "centrifugal couple", due to rotation about a line which is not parallel to a principal axis balances the turning moment due to the excess of pressure on the outer wing which is moving the more rapidly, and in giving prominence to this equation the object is to ascertain how far it is possible to dispense with *ailerons*.

Now the equation (6p) requires that  $\sin \phi$  should be proportional to  $a$ , other things being the same, that is that

$$a \operatorname{cosec} \phi = \frac{B - C}{2Kl^1\mu g} = \text{constant} \quad (7p)$$

The interpretation of this is that if the plane of symmetry of the aeroplane meets the vertical  $OI$  in a point  $Z$ , then  $MZ$  is always equal to the constant of (7p). Thus keeping  $Z$  fixed, the various possible circular paths will be such that the path which  $M$  always describes is a circular section of a fixed sphere through the centre of which the plane of symmetry passes. If  $G$  coincided with  $M$  as in the Case I. we might imagine the aeroplane tied by a rope or, better, attached by a rigid connection to the point  $Z$ , and it may be convenient to think of boys swinging round a maypole in order to picture the possible motions.

On the other hand, the conditions of equilibrium, in rectilinear motion, give

$$W = KS^1U_0^2\mu$$

assuming that the system is a single lifting one with neutral tail. From these we get

$$\begin{aligned} a \operatorname{cosec} \phi &= \frac{r_1^2 - r_2^2}{2k^2} \frac{U_0^2}{g} \\ &= \frac{r_1^2 - r_2^2}{k^2} \times \text{velocity height corresponding to } U_0 \end{aligned} \quad (8p)$$

where  $k$  is the radius of gyration of the surfaces,  $r_1, r_2, r_3$  the radii of gyration of the masses of the aeroplane

If now, we try to combine this equation with the condition  $Z_1 = 0$  we get

$$\begin{aligned} \sin \phi &= \frac{U^2}{U_0^2} \frac{2k^2}{r_2^2 - r_3^2} \\ &= \frac{2k^2}{r_2^2 - r_3^2} \text{ if } U = U_0 \end{aligned} \quad (9)$$

and the angle  $\phi$  will therefore not be small. The radius  $a$  will therefore not be large compared with the velocity height  $U^2/g$ .

6. The only way, therefore, of making the machine describe curves of different radii will be by varying  $c$  so as to increase the radius from  $a$  to  $\sqrt{a^2 + c^2}$ .

Although in small oscillations there are no resistance-derivatives  $X_0, Y_0, N_0$ , it is clear that the effects of the lateral velocity  $w$  or  $\Omega c$  only vanish to the first order in  $w$ , and that when  $w$  is large it may have a very considerable effect on the longitudinal motion, the extra terms thus introduced into the equations being of the order  $w^2$  instead of  $w$ . In fact, according to the sine law of resistance, we should take the resultant thrust on the plane to be

$$KS\Omega \sqrt{a^2 + c^2} \times (a\Omega \sin \alpha + c\Omega \sin \phi \cos \alpha)$$

and similarly the value of  $U$  should be taken as  $\Omega \sqrt{a^2 + c^2}$  instead of  $\Omega a$ , in forming the expressions for the lateral couples  $L, M$ , thus increasing them in the ratio of  $\sqrt{a^2 + c^2}$  to  $a$ .

(Continued on page 65)

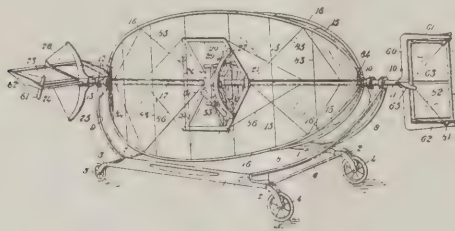


# RECENT AERO PATENTS

BY WILLIAM N. MOORE

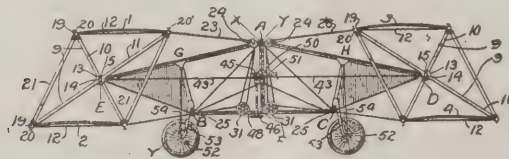
1,143,817. FLYING MACHINE. GEORGE M. ECKENWILER, Canton, Ohio, assignor of nine-twentieths to Ernest Singer, Fred Singer, Arthur Claypool, Joseph Adams, Alfred Crider, John Brogden, William O'Brien, Albert Grimm, Vincent Pennell, and Dale Pennell, Canton, Ohio. Filed Aug. 19, 1912. Serial No. 715,700. (Cl. 244—14.)

1. A flying machine comprising an aeroplane structure formed of intersecting planes adapted for movement through the air in the direction of the line of their intersection said planes, intermediate their forward and rear ends, having portions cut out of the bodies of said planes adjacent said line of intersection and producing an opening in said planes in the midst of the aeroplane structure, a main shaft extending throughout the length of said aeroplane structure at the line of intersection of said planes, said planes extending to and connected to said shaft to the front and rear of said opening, and propelling means arranged within the said opening and connected to said main shaft, said aeroplane structure adapted for rotation about said shaft and with relation to said propelling means.



1,145,960. AERIAL VEHICLE. ROBERT D. ANDREWS, Brookline, Mass. Filed Sept. 28, 1908. Serial No. 454,968. (Cl. 244—14.)

1. An apparatus of the class described comprising in combination, fore and aft main supporting surfaces, and connecting means therefor comprising adjustably connected members having provision causing them to tend to remain normally in one plane.

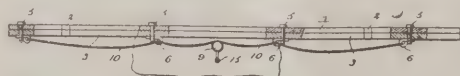


1,134,492. DETACHING APPARATUS FOR USE ON HYDRO-AEROPLANES TO PROMOTE SAFETY IN AIR NAVIGATION. WILLIAM H. SEABROOK, Jr., Savannah, Ga. Filed Sept. 2, 1914. Serial No. 859,925. (Cl. 244—21.)

1. In a flying machine, a gas bag supporting frame provided with a plurality of openings, and aeroplane frame provided with a plurality of openings adapted to register with the openings in the gas bag supporting frame, apertured bolts passing through the registered openings, pins passing through the apertures in each of the bolts, to secure the frames together, and means for withdrawing the pins to permit of disconnection of the frames.

2. In a flying machine, a gas bag supporting frame provided with a plurality of bolt openings, an aeroplane frame provided with a plurality of bolt openings adapted to register with the openings in the gas supporting frame, a plurality of apertured bolts adapted to pass through the openings, pins passing through the apertures in said bolts to secure the frames together, a drum carried by the aeroplane frame, and means passing around said drum for withdrawing the pins from the bolts to permit of disconnection of the frames.

3. In a flying machine, a gas bag supporting frame, an aeroplane frame, apertured bolts passing through said frames, pins in the apertures of the said bolts to secure the frames together, a drum carried by the aeroplane frame, and means operated by said drum to withdraw the pins from the apertures in the bolts to permit of disconnection of the frames.



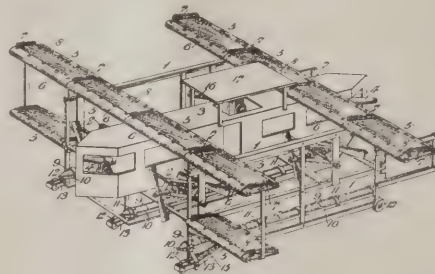
1,138,724. AIRSHIP. JOHN W. BOUGHTON, Philadelphia, Pa., assignor to The Boughton Flying Machine Company, a Corporation of South Dakota. Filed May 24, 1913. Serial No. 769,568. (Cl. 244—2.)

1. In an airship, a frame, and a buoyant pontoon of separable hollow caissons arranged end to end lengthwise of the ship and supported on said frame.

2. In an airship, a frame, and a buoyant pontoon of separable hollow sections arranged end to end lengthwise of the ship, combined with a longitudinally divided support in which said sections are removably held.

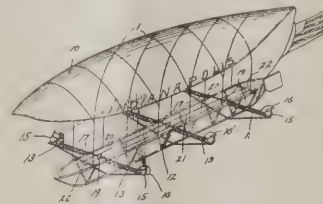
3. In an airship, a frame, a buoyant pontoon composed of separable hollow caissons arranged end to end lengthwise of the ship, a longitudinally divided support in which said caissons are removably located, and means holding said longitudinally divided support fixedly in position.

4. In an airship, a frame, a buoyant pontoon formed of separable hollow members disposed end to end in the direction of the length of the ship, and a rack secured to said frame and divided in longitudinal directions, and having means embracing said hollow members and detachably holding them in the rack.



1,143,807. ADVERTISING-LIGHTING FOR DIRIGIBLE BALLOONS. GEORGE L. BUMBAUGH, Indianapolis Ind., assignor of one-half to Albert L. Watters, Indianapolis, Ind. Filed Oct. 5, 1914. Serial No. 865,033. (Cl. 240—2.)

1. In a balloon, the combination of a gas bag, a frame supported thereby, one or more lamps carried by said frame and illuminating the under side of the gas bag, and one or more shades cooperating with said lamp or lamps and movable relatively thereto to control the area of gas-bag surface illuminated.

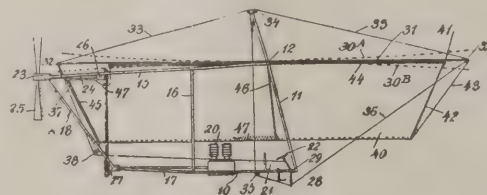


1,145,973. AEROPLANE. HARRY B. CHALMERS, Dedham, Mass. Filed Aug. 3, 1910. Serial No. 575,320. (Cl. 244—29.)

1. An aeroplane having a vertical plane running through substantially the whole length of the apparatus and means for bending said plane transversely throughout its length to guide the aeroplane horizontally.

2. An aeroplane having a vertical plane and means for moving both the upper forward portion and the upper rear portion of said plane to one side and the lower central part thereof to the opposite side.

3. An aeroplane comprising a substantially horizontal main plane, a single vertical longitudinal plane below said main plane, and means for bending the vertical longitudinal plane to direct the movement of the aeroplane horizontally and for bending the entire main plane longitudinally throughout its length to guide the aeroplane vertically.







# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

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**PACIFIC NORTHWEST MODEL AERO CLUB**  
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**AERO CLUB OF ST. LOUIS**  
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**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### Aero Science Club of America

By G. A. CAVANAGH

It was decided late in the afternoon of September 26th that the hydro contest of the national competition would have to be called off in view of exceptionally bad weather. All four clubs in the vicinity of New York, The Aero Science, Harlem, Summit and Bay Ridge clubs, were well represented, but conditions were so bad that all excepting Schultz and Barker, of the Harlem Club, made no effort to fly. Schultz made two flights of 44 and 45 seconds each. On the third attempt his model was caught in a sudden gust and was slightly damaged. Barker flew twice, making 30 and 33 seconds. The improvised pond worked out better than was expected. A letter will be sent to the Contest Committee of the Aero Club of America asking for permission to hold the contest on October 3d, in view of the fact that nothing could be done regarding a place for the holding of the contest until the last minute when it was decided to improvise a pond. If the clubs are granted permission to fly on October 3d, everything is in readiness to hold the meet.

Through the courtesy of Mr. George A. Gray, the aviator, many of the flyers left their machines in his hangar in anticipation of the contest being held on October 3d. Mr. Gray also permitted the contestants to remain in his hangar during the storm.

At the last meeting Mr. Harry G. Schultz was elected president, succeeding Mr. Obst, who resigned. Mr. Obst being overburdened with business affairs, found it impossible to serve the club in that capacity. Mr. Schultz has been an active worker in the affairs of the club since its organization. The membership certificates were received at the club. They will be properly filled in and one mailed to every member of the club and its affiliated clubs. The Aero Science Club has been asked to co-operate with the Y. M. C. A. of Orange, N. J., in the matter of holding a monstrous model aeroplane competition on Election Day, November 2d. A committee was appointed at a past meeting to look into the matter of co-operating with the Y. M. C. A. The committee appointed are as follows: Messrs. Harry G. Schultz, G. A. Cavanagh, Chas. Wm. Meyers, Wm. Hodgins, R. C. King, Jr.

It is hoped to make this an extraordinary large contest and many members of the club have agreed to loan as many models as possible for exhibiting purposes. Mr. John Flem-

ing has offered the use of his extra large kites for the purpose of carrying banners.

For further particulars address the Secretary, 29 West Thirty-ninth street, New York City.

### Pacific Northwest Model Aero Club

By ROBT. LA TOUR

The Pacific Northwest Model Aero Club held its elimination contest for hydro models September 20th at Green Lake to decide the representatives for this club for the National Model Competition. Those making the team and their best flights were Frank Barney, 30 seconds; George Stoneham, 30 seconds; Lawrence Garrick, 25 seconds; Robert La Tour, flying boat, 33 seconds, with René Valadon acting as substitute.

### Big Model Aeroplane Contest to be Held in Orange, N. J.

On November 2, 1915 (Election Day), a Model Aeroplane Contest will be held in Orange, N. J., under the auspices of the Y. M. C. A. of the Oranges, N. J. assisted by the Aero Science Club of America.

Contest Committee: R. M. Jacobus, Chairman, Orange; H. B. Grant, Secretary, Orange; David Hunter, West Orange; C. T. Schwarze, South Orange; Frank Wildey, South Orange; Ralph E. Files, East Orange; O. F. Raab, Orange; George A. Cavanagh, Secretary Aero Science Club of America, and other members of the club.

This contest is open to all young men of the Oranges under 21 years of age. The contest will be made up of groups of twenty-five flyers. Each group to have one judge and will be held on both morning and afternoon of Election Day.

### Nature of Contest

The contest will be for duration, one contestant at a time will launch his model into the air, the model being timed by the judge from the moment it leaves the hand until it lands. Each contestant to be allowed three attempts.

### Prizes

Three prizes will be allotted to each group. Prizes are as follows:

First Prize: Valuable kit of tools especially adapted for model construction.

Second Prize: Silver medal.

Third Prize: Bronze Medal.

(Continued on page 65)



Wallace A. Lauder of the Summit Model Aero Club, on the left, willingly helping his competitors during the contest. Mr. Lauder broke the world's distance record with a flight of 3537 feet, thus winning the first contest of the series for the Aero Club of America Prizes.





Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Not Easier Said than Done

She (to workman finishing bottom of flying boat hull)—  
Are you copper-bottoming 'em, my man?  
He—No; I'm aluminizing 'em, mum.

#### The Zeppelin Moth

From its size this insect appears more harmful than it really is. It has been known to drop its eggs on and destroy cabbages. Many growers remove their young plants to cellars when they see this moth hovering about, as it seems to have an especial liking for anything young and tender—*Punch*.

#### The Spy Glowworm

This has been observed on the East Coast. It has a well developed motor nerve, which causes it to move about quickly. After dark it emits a bright light, and this attracts the Zeppelin moth. Any good copper preparation will arrest this evil.—*Punch*.

A congressional debate on what shall be appropriated for aeronautics is a scheme for keeping people from finding out what they are talking about.

#### Peru Reducing Army

Lima, Peru, September 15.—Following the passage of the law granting political amnesty the government is reducing the Peruvian army and paying the passage home of the five men mustered out of the service. But the air service will remain the same!

An old lady was once visiting a hangar and was having all the good points explained to her of the aeroplane when she asked the mechanic:

"When the aviator gets tired while he is up in the sky, what does he do?"

"Why, mum, he hangs the blooming thing up to a SKY HOOK."

A young lady was once watching an aviator making some loops and other peculiar things in the air when she suddenly turned to Paternal Relative and said:

"Oh, look, pa, isn't that awfully aeronauty."

A farmer one day was having a look at a dirigible at a country fair and was listening to a dissertation on the motor, when the lecturer came to the engine shaft and explained how the piston by its explosion forced the crankshaft to turn. He said:

"Well, by hick, I knew there was only a crank that could make the pesky thing go."

#### The Birdmen

Afloat on the billows of ether,  
Tossed by the tides of the air,  
Braving the unseen currents,  
Onward the birdmen fare.

Scorning the earth-worn pathways,  
Riding the waves of the sky,  
Free as the flight of an eagle,  
Fearless and bold they fly.

Not for the empty plaudits,  
The noise of the cheering crowds;  
For a mightier impulse leads them  
To the lure of the trackless clouds.

They are the pilots of progress,  
They are the pioneers,  
Brave scouts of the world's advancement  
Who die for the coming years.

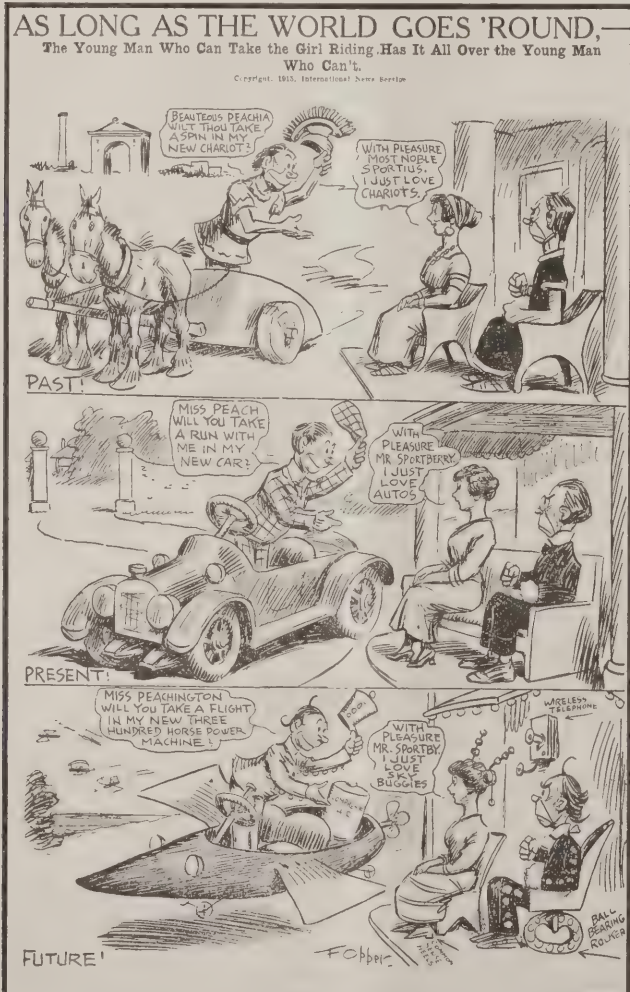
Ever the stern, grim spectre  
Claims its insatiate toll;  
Ever the pale death angel  
Writes on the mystic scroll.

But what if they swerve or falter?  
And what if they fall and die?  
'Tis not of the cost they reckon,  
These mariners of the sky.

For never a truth has been added  
To the sum of the great world's lore,  
But the lives of her bravest martyrs  
Have paid to the utmost score.

And this is a sign and a token;  
A symbol of things to be,  
When man shall be lord of the teeming earth,  
The land, and the air, and the sea.

JOHN CLEM BRADSHAW.



(Courtesy N. Y. American)



(Continued from page 63)

A beautiful silver cup will be awarded to the contestant whose model obtains the greatest duration over all others. A gold medal will be awarded to the contestant having the second best record.

**General Rules Governing the Contest**

The first half of the contest will officially open at 9 o'clock and close at 12 o'clock.

The second half of the contest will officially open at 1 o'clock and close at 4 o'clock.

No contestant will be permitted to fly after the contest has been officially closed.

Each contestant will be allowed three trials. However, another trial may be granted in the event of the contestant's model colliding while in flight with objects, such as fence posts, trees, walls, houses, etc. The judges shall have power to grant another trial. Another trial will not be granted in the event of a propeller coming off, rubber dropping off, wings becoming loose or any other part of the machine becoming loose while the model is in flight.

Each contestant will be allowed to enter three machines, it being understood that each machine must retain its original design throughout the contest. No contestant shall be permitted to use parts of one model upon another. Repairing will be permitted.

In the event of the contestant desiring to launch his machine he will notify the judge who in turn will inform him when to start and who will time the model from the moment it leaves contestant's hand until it lands.

All disputes will be settled by the committee in charge.

Each contestant will be assigned a number and when desiring to fly his model will give number to judge.

On the evenings of September 30th and October 1st, at 8 P. M., at the Y. M. C. A. Building, 419 Main street, Orange, N. J., instructions were given to a number of those desiring to enter the contest.

Application blanks may be obtained from H. B. Grant, Y. M. C. A., Orange, N. J., and Mr. Grant will furnish any additional information desired.

**Illinois Model Aero Club**  
By Jos. J. LUCAS

The Illinois Model Aero Club held its hydro meet of the National Model Aeroplane Competition, Sunday, September 19th, at Lake Calumet. The team picked by the elimination meet was Cook, Schweitzer, Pease and Lucas, but Lucas was unable to be present, so Hittle, the first substitute, was put in his place. The very first flight of the afternoon broke the former world's record. Pease raised the record for twin propeller models from 67 seconds to 71.8 seconds. Hittle followed with a flight of 70.6 seconds with a single propeller tractor hydro model. From there on the record went on up to 82 seconds by Hittle, then to 100.6 seconds by Cook, finally stopping at 116 seconds, made by Hittle. The total results of the day are as follows: Hittle, 70.6 seconds, 82.4 seconds, 116 seconds; average, 89.6 seconds. Cook, 100.6 seconds, 57 seconds, 98 seconds; average, 85.2 seconds. Pease, 71.8 seconds, 45 seconds, 55 seconds; average, 57.2 seconds. Schweitzer, 53.8 seconds, 52.6 seconds, 38 seconds; average, 48.1 seconds. Club average, 70.02 seconds.

The tractor that Hittle used was quite large, being over 50 inches in length and having a span of over 40 inches, and yet it weighs only 1.75 ounces. It is quite slow and very steady in the air and interesting to watch. The model Cook used was a 40-inch twin propeller model weighing 3 ounces. It gets off the water immediately and quickly climbs to a good altitude, which it maintains during the flight, which ends with a good glide.

Too much cannot be said in praise of Mr. Charles Dickinson, the president of the Aero Club of Illinois, who gladly gave us the use of his hydro station at Lake Calumet and provided boats and lunch whenever we had meets there. He and Mr. Stephens, the vice-president of the Aero Club of Illinois, were the judges who were present at the meet.

Lake Calumet, where we have held all of our meets this year, is as near perfect for that purpose as one could find. It is easy to get to, is three miles long, and over a mile wide, and most of it is less than three feet deep, so that it is not necessary to wind or launch a model from a boat.

Our president, Chicago Boy Aviator Laird, is having quite a successful exhibition season with his nifty little 12 horsepower Hofer-motored tractor biplane. He has the able assistance of George Weaver, former secretary of the I. M. A. C. as mechanic. Labor Day he flew in Seebing, O. Since then he has flown in Syracuse and LaGrange, Ind., and in Missouri Valley, Iowa. He is now in Michigan on another date. His flight in Missouri Valley lasted 18 minutes and he got up to an altitude of 1,100 feet, flying at a speed of 45 miles per hour which is quite good considering his low power.

(Continued from page 61)

With regard to the longitudinal equations (5u) and (5v) these need not occasion much difficulty. A small change  $uY_1$  in the velocity  $U$  will be sufficient to make  $Y_1$  vanish, and the necessary value of  $X_1$  in (5u) can be obtained by a small variation in the propeller thrust;  $X_1$  representing the (positive or negative) decrease in the thrust. By substituting in (5v) from (6w) and the conditions of equilibrium, I obtain

$$\frac{2u}{U} = \sec \phi - 1 - \frac{c}{(a^2 + c^2)} \sin \phi \cot \alpha \quad (10)$$

In (5u) the term  $Wc\Omega^2/g$  represents the component of centrifugal force along the axis of  $z$ , which of course has to be balanced by the thrust of the engine.

**III.—EFFECTS OF THE RUDDER.**

7. So long as the only vertical auxiliary planes are placed on the same level as the centre of gravity and not above it, these will have no effect on equations (6p), (7p), (8p), and the only effects will be to modify the condition of equilibrium resulting from (5w) which will no longer assume the form (6w)

Now we have found that a rudder plane must exert a couple  $M_1$  given by (7q) in order to turn the aeroplane, and if this rudder is placed at a distance  $l$  behind the centre of gravity,  $M_1/l$  will represent the thrust  $Z_1$  along the negative direction of the axis of  $Z$

(To be continued)

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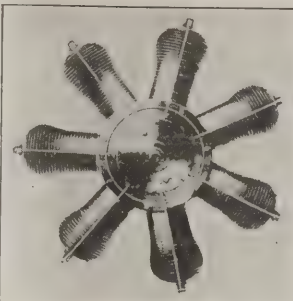
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VOL. II NEW YORK, October 11, 1915 No. 4

## President Wilson Favors Six Million Dollars' Appropriation for Navy Aeronautics

**A**FTER a conference between President Wilson, Secretary Daniels and the naval authorities, it is announced that the administration favors a naval program which will include, among other things an appropriation of six million dollars for aeroplanes. The entire naval program proposed will total to \$239,-350,000.

This program shows an admirable consideration on the part of the administration of all the factors necessary to give this country an increase of naval armament without arousing the unreasonable opposition of the "Peace-at-Any-Price" advocates—who are, by the way, growing fewer and fewer in numbers.

The interior states who heretofore did not seem to appreciate the need of an adequate navy, have been taught a lesson by this war. They know how that only a sufficient navy could keep the seas open to commerce—for the distribution of exactly the products of the interior states. They realize that an adequate navy means protection to their interests as much as to the interest of states on the coast. Therefore there are the full support for the administration's naval program.

\* \* \*

**P**RESIDENT WILSON'S proposal to realize the sums necessary to meet the cost of bettering our defenses by either a bond issue, selling of Panama Canal Bonds, or a special security, is hailed by those interested in aeronautics as affording the only hope to secure the \$17,500,000 appropriations necessary to meet the aeronautic needs of the Army, Navy and Militia. In a letter written to the presidents of twenty-six aero clubs, affiliated with the Aero Club of America, and to the heads of the National Guard and the Naval Militia of forty-eight states, Mr. Alan R. Hawley, president of the Aero Club of America, urges support to any plan which President Wilson may propose to raise the necessary sum to meet the cost of adequate armament, and warns that unless this support is given and the necessary funds are obtained, the air service will suffer the same treatment as in the last years when there has never been allowed sufficient money to form even the skeleton of an aeronautical organization for the Army and Navy. As a result the Army, Navy and Militia have, together, only a dozen aeroplanes.

What is required this year is \$7,500,000 for the Navy,, \$5,000,000 for the Army, and \$5,000,000 for the Militia. The Army and Navy have now only one aviation station each, whereas there should be one at every military and naval center. The Philip-

pinas, Hawaii and the Panama Canal have no aerial defense—there being not a single aeroplane at any of these important possessions.

The Militia has no aeroplanes at all outside of the few obtained through the National Aeroplane Fund, instituted by the Aero Club of America, to relieve this deficiency. But for this fund the Militia would not have had any aeroplanes for the maneuvers—just as there were no aeroplanes at Tobyhanna in connection with the field artillery practice, or in connection with the fleet maneuvers. The purpose of having armies and navies is for defense, that means defense against armies and navies well provided with air craft. Without air craft armies and navies are blind, and at a disadvantage that would be fatal—as was shown by the defeats sustained by Russia through having only about one hundred aviators fully equipped and trained, whereas Germany has four times that many.

Appropriations for aeroplanes can be obtained only if the general appropriations are increased. Otherwise money would have to be taken from the regular allowances for such necessities as guns, and ammunition which the Army and Navy heads are, very justly, unwilling to do.

## National Aeroplane Fund Affords Start for Aviation Corps Along Mexican Border

**T**O enable California, Arizona and Texas, the states bordering on the Mexican line, to start immediately to train officers of the Militia in flying and military aeronautics, and to organize aviation corps for those states, the Executive Committee of the National Aeroplane Fund has decided to contribute \$2,000.

Five aeroplanes have been offered for training officers of the Militia of California, Arizona and Texas by Mr. Earle Remington, a western sportsman. The \$2,000 of the National Aeroplane Fund will be apportioned at the rate of \$400 to each of the machines offered. This sum will enable the Militia authorities of the three states to have one officer of the Militia trained to pilot an aeroplane so that he can thereafter train other officers of the Militia and volunteers who want to join the Militia aviation corps.

Aviators are needed at the present time at the Mexican border. They are perhaps needed more than any other arm of the Service, as they can do more to preserve order and prevent the loss of American lives than any other arm of the Service. Italy and France found aeroplanes to be invaluable in their campaigns in Tripolitania and Morocco. Without aeroplanes they had, in fact, been unable to cope with the harassing reprisals from hostile native tribes. Their



air service drove the natives so far into the interior that all surprises and "sniping" were made impossible. We need aeroplanes at the Mexican border, and unless our War Department gains from the experiences of France and Italy, American lives, the lives of valuable soldiers, of whom we already have too few, will be lost.

The \$5,000 donated by an interested person whose name is withheld from publication on request, for the purpose of training officers of the Militia of New York and Massachusetts, will be divided as follows: National Guard of New York, \$1,250; National Guard of Massachusetts, \$1,250; Naval Militia of New York, \$1,250, and Naval Militia of Massachusetts, \$1,250. This sum will, in each case, pay for the training of three officers of the Militia, affording them a thorough course in piloting an aeroplane and enabling them to take the Aero Club of America's pilot license.

The matter of selecting the aviation school at which they are to be trained is left entirely to the Militia authorities, who are urged to take the advice of the War and Navy Departments in this matter in order to insure uniformity of training and organization.

This will make almost \$20,000 that has been given to the National Guard and Naval Militia of New York State through the National Aeroplane Fund, which was instituted by the Aero Club of America a few months ago, and by next Spring both organizations will have the nucleus of an aviation corps.

In view of the fact that New York and Massachusetts will have 14 officers of the National Guard and Naval Militia to train, the Aero Club of America will suggest to the War and Navy Departments that arrangements be made to train these officers in the Army and Navy Aviation Schools, thereby insuring a thorough course in military aeronautics and uniformity of training.

If the Army and Navy Departments should accede to this suggestion it is not likely that the Federal Government would accept payment for training the officers, so the money intended for this purpose could be used for the incidental expenses of the organization and for the upkeep of the aviation corps.

Besides the \$5,000 and the five aeroplanes offered by Mr. Remington, the contributions to the National Aeroplane Fund in the past month have been as follows:

A bonus of 10 per cent, amounting to \$2,146.11, on all amounts raised by the National Aeroplane Fund, paid by Mr. Emerson McMillin; Packard Motor Car Co., \$250; "Woman Subscriber," \$100; J. N. Willys, \$100; Dudley O. Scott, \$50; I. W. England, \$25; Frederic Schenck, \$25; Chas. A. Warren, \$25; Louis Dempsey, \$25; J. Frederick Sener, \$25; Wm. W. Weitling, \$25; Thomas E. Kirby, \$25; J. Edgar Bull, \$25; Gardner Meeker, \$20; A. Murray Young, \$15; Edward King, \$10; Margaret H. Garrard, \$10; G. P. Conard, \$10; Theophilus Olena, \$10; Calvin Thayer Adams, \$10; H. Pushae Williams, \$10; R. N. Haan, \$10; Oscar Teague, \$10; C. H. De La Vergne, \$8; Murray H. Coggeshall, \$5; Wm. F. Robertson, \$5; G. F. Johnston, \$5; C. Anderson, \$5; Sandford & Sanford, \$5; Basil Miles, \$5; John Fleming, \$5; Daniel R. Robert, \$5; J. Klaw, \$5; Jos. D. Holmes, \$2; Solomon Foster, \$1; Henry G. Beyer, M.D., \$25; Passaic Metal Ware Co., \$25; Harold C. Bullard, \$25; Theodore R. Hoyt, \$25; W. S. Bigelow, M.D., \$25; C. LeRoy Hendrickson, \$25; Leon P. Fuestman, \$15; Albert E. Gallatin, \$15; Chas. A. Sherman, \$15; C. M. C. Reeve, \$10; Moses Beckett, \$5; F. E. Serrell, \$2; J. Insley Blair, \$50; Horace G. Young, \$25; Geo. B. Vanderpoel, \$25; J. S. Delahanty, \$25; William G. Low, \$25; Norman Langhorst, \$25; P. H. W. Ross, \$25; J. F. Curtis, \$25; Theodore Sternfeld, \$25; S. N. Bond, \$20; C. C. Fitzgerald, \$20; W. B. Kinney, \$10; R. Bachia, \$10; F. H. Paine, \$1; E. E. Kilpatrick, \$1, which bring the total contributions to the National Aeroplane Fund to \$29,049.11. There also have been received gifts of two flying boats and courses of instruction valued at \$16,500, making a grand total of \$45,549.11.

## Aeroplanes for the United States

(Editorial in Tucson, Ariz., Star.)

THE United States army and navy have, together, less than twenty aeroplanes available. Only half a dozen of the licensed aviators of the United States have made flights of more than fifty miles, and none know even the rudiments of military aeronautical requirements. Our army, navy, national guard and naval militia have no experience in handling aircraft or operating with them. Such is the startling information given out by the Aero Club of America.

Both the war and navy department, realizing the necessity of forming an aeronautical reserve composed of volunteers, are planning for the eventual organization of fifteen aviation squadrons for the national guard and twenty-two squadrons for the naval militia. The navy, while anxious to provide all the aeroplanes necessary to form aviation corps for the naval militia, is handicapped through its limited appropriations, and has asked the commanding officers to co-operate with the Aero Club of America in raising a fund by public subscription; and in getting suitable men to volunteer their services for these corps, the navy to train these men at its own aeronautical center. The army, having less than one-third the resources of the navy, cannot afford to offer aeroplanes to the national guard at this time, therefore the immediate needs must be met by volunteer contributions, as has been done in France, Germany and Italy.

Already through the efforts to the Aero Club of America ten aeroplanes and \$8,000 in cash subscriptions have been secured for this cause. The War Department's organizational plans call for the maintenance of an aero squadron of organized militia in each of four States—*viz.*, New York, Pennsylvania, Illinois and Texas. This number, the authorities urge, should eventually be increased to one for each tactical division, fifteen in all. An aero squadron consists, according to the tables of organization, of twenty-one officers and ninety-three enlisted men, operating eight aeroplanes. Volunteers—men with knowledge of aeroplanes or gas engines, and electricians with knowledge of radio as applied to aeroplanes—are urgently needed to make the realization of all these plans possible and to form the corps.

If the United States needs this equipment in order to provide for the common defense, and judging from the best available information it seems that she does, there is no reason why the citizens of this country cannot do as well as France and Germany, where the sums of \$1,222,969 and \$1,808,625 respectively were raised for aeronautical purposes by popular subscription.

### The Air Defenses

That the work of the Aero Club of America in raising money for the fund is appreciated by men who will help solve the defense problem is shown in letters written by senators and representatives. More than \$30,000 has been subscribed, and the club has presented aeroplanes to the militia of New York, Pennsylvania and Vermont and to the naval militia of New York and Wisconsin. Senator Wadsworth has expressed hearty approval of efforts to establish adequate military and naval aviation equipment and personnel, and Senator Weeks said that congress must take hold of the development of the aviation work of the army and navy in a very comprehensive way at the next session. It would be the height of folly, he added, to neglect to do so. Senator Lodge states the situation as it is understood by those who have noted the work of air craft in Europe. He says in his letter to the club that an army and navy without aeroplanes would be helpless in the face of an enemy provided with them. Not less significant is the attitude of army and navy officers and officials of the departments. There is general recognition of the importance of providing adequate air defense, as well as strengthening the submarine fleet.—*Editorial—Rochester (N. Y.) Post-Express.*



# THE NEWS OF THE WEEK

## American Society of Aeronautic Engineers Appoints New Directors

Ten additional directors, all prominent authorities, have been appointed to represent the important institutions interested in aeronautics, in the Executive Board of the American Society of Aeronautic Engineers, to meet the need for a purely technical aeronautical organization.

The appointments are as follows:

U. S. Army: Captain A. S. Cowan, Commanding S. C. A. S., and Captain V. E. Clark, Chief Aeronautical Engineer, U. S. Army.

U. S. Navy: Lieut. Commander Henry C. Mustin and C. Holden Richardson, Naval Constructor.

Smithsonian Institution: Dr. Albert F. Zahm.

Weather Bureau: Professor William R. Blair, in charge of aerological investigation.

Bureau of Standards: Dr. D. E. Buckingham.

Massachusetts Institute of Technology: Lieut. Jerome C. Hunsaker, U. S. N.

University of Michigan: Dr. Herbert C. Sadler.

Aero Club of America: Alan R. Hawley.

Messrs. Henry A. Wise Wood and Elmer A. Sperry, who represent the American Society of Aeronautic Engineers in the Naval Advisory Board of Inventions, are in Washington in connection with the organization of the Board, at the invitation of Secretary Daniels.

## Governor Whitman Authorizes Organization of Air Corps for New York National Guard

Governor Whitman has authorized the organization of an aviation section of the Signal Corps of the National Guard of the State of New York. In order to expedite the establishment of such an important asset to the organized militia, Major General John F. O'Ryan, commanding general of the State forces, will call a conference of those interested in the movement within a few days.

For two years the officers at Division Headquarters have been considering the matter of organization of aviation units and ways and means of providing the material things required by such units. The Governor was keenly interested in the development of aviation in the military service, but until the Legislature made financial provisions for its support its maintenance must be without expense to the State. This procedure is necessary because at the present time there are no State funds available which could be used for the purpose. Hence the gift made through the Aero Club was particularly opportune.

The detachment will be organized under the supervision of Major William L. Hallahan, Chief Signal Officer, National Guard. Applications for enlistment in the new detachment should be addressed to Chief Signal Officer, Headquarters Division, Municipal Building, New York City, N. Y.

## Vincent Astor, Harry Payne Whitney, Robert G. Fowler and Others To Form Aviation Colony in Florida

Florida is to have a colony of sportsmen fliers during the winter.

Among these will be Vincent Astor, G. Maurice Heckscher, son of Commodore August Heckscher; Robert Glendinning, the banker of Philadelphia and this city; Clarke Tomson, of Philadelphia and New York; Harry Payne Whitney, and a number of others.

During October these sportsmen fliers plan to take their hydroaeroplanes to Florida, where a flying colony will be formed at Miami. They will fly daily, and, as all can carry one or two passengers apiece, they plan to use the machines for outings and excursions to the unfrequented and practically unexplored portions of that State. All the machines have a flying radius of up to 500 miles, and the slowest make better than 45 miles an hour.

Residents of Manhasset, L. I., have been interested to see a high-powered hydroaeroplane, carrying two persons, skimming across the surface of the bay, and now and then making short flights. Those in the airboat were Harry Payne Whitney, of Roslyn, L. I., and Robert G. Fowler, the aviator, who is teaching Mr. Whitney to fly.

Mr. Whitney bought the hydroaeroplane, which is of the Burgess-Dunne type, with a 100-horsepower motor, about three weeks ago. Clifford L. Webster, of the Burgess-Dunne Company, brought the machine from Marblehead, Me., and will remain at Manhasset Bay for the next few days until he is sure that Fowler requires no further assistance in handling it and in instructing Mr. Whitney, who will take daily flights from now on. Mr. Whitney wishes to qualify for his license as soon as possible, and yesterday he had advanced so far in the course of instruction that he was allowed to handle the controls for short flights.

## The National Balloon Race

The National Race for Spherical Balloons is scheduled to take place at Wichita, Kan., on October 7, as we go to. This race is to be held under the auspices of the Wichita Aero Club, which has recently been received into affiliation by the Aero Club of America and is sanctioned by the Aero Club of America. The prize money amounts to One Thousand Dollars and is to be divided as follows: First Prize, \$400; Second Prize, \$300; Third Prize, \$200 and Fourth Prize, \$100. Up to press date, four entries have been made—viz., William F. Assmann, Paul J. McCullough, H. E. Honeywell and Warren Rasor. Natural gas is to be used, and if this proves successful it will open a large field for the sport of ballooning.

Flying boat constructed by the Cooper Aircraft Company. It is equipped with a six-cylinder vertical Wisconsin motor, and the wings have a spread of forty-four feet.







Monte Rolfe, the boy aviator, who is making exhibition flights in the West.

#### Philadelphia as Aero Center

The Aero Club of Pennsylvania is completing plans to establish an aero center at Philadelphia. The Navy Department has granted permission to use League Island for aviation purposes and a fund is to be raised for building hangars. Messrs. Robert Glendinning and Clarke Thomson, who have Curtiss flying boats, which they fly almost daily, are creating much interest among sportsmen and militia authorities and substantial developments are expected in the near future.

#### Kansas City Aero Club Issues Call for Volunteers

Through its president, George M. Myers, who is also a governor of the Aero Club of America, the Kansas City Aero Club is calling for volunteers and workers to form a local aviation company to be enrolled as a part of the Missouri National Guard.

Already several applications have been received by Mr. Myers. They are from men who have been identified with aeronautical work in various parts of the country. Now the Aero Club is interested in obtaining the applications of men who have had mechanical and engineering training that would fit them for actual service. Mr. Myers will receive volunteers and offers of assistance in the organization of the company at his office, 506 New England Building, Kansas City, Mo.

#### Santos-Dumont Calls Zeppelins Failures

Alberto Santos-Dumont, inventor of the original dirigible airship, passed through Havana, October 3, on his way to New York. When interviewed he said he believed the German Zeppelins have proved a failure from a military standpoint, as in the present war they were known to have destroyed only non-combatants. On the other hand, he added, the aeroplane has been shown to be wonderfully effective in warfare.

#### New Revolving Cylinder Motor in Washington, D. C.

R. S. Moore, of Washington, D. C., announces a new revolving cylinder motor which it is claimed will meet all military requirements, and which will have a range of speed from 250 R. P. M. to 1,400 R. P. M.

Mr. Moore thus describes it: "The new motor has a very large exhaust valve in the head of each cylinder which will run the power curve much higher than in the present Gyro motor.

"It has a small intake valve on the side of the cylinders opposite the spark plug which will help to keep the hottest side of the cylinder cool. This valve takes in a very rich charge of gas, and the exhaust valve remains open during part of the suction stroke, taking in fresh air to mix with the heavy gas coming in through the intake valve.

"The intake cam is a twin making it possible to hold the intake valve open during the intake stroke, and during any part of the compression stroke, thus allowing gas to be pushed back into the mixing chamber and to be taken up by the next cylinder on its suction stroke.

"This motor can carry a rather high compression and still be used in the hottest climates, as compression is adjusted to climatic conditions and can be increased according to altitude. The variable compression device is not complicated and there are no more working parts in the motor than in other types of motors.

"Another feature of value lies in the fact that two or more can be used on one machine, as they can be adjusted while running to give exactly the same amount of power, or if one goes out of commission the compression can be thrown entirely off the dead one.

"The new motor is especially adapted to the chain drive as they can be started as smoothly as a steam engine."

#### Pioneer Motor Expert Visits Aero Club

Mr. Patrick Y. Alexander, the pioneer aeronautical motor expert, who close on ten years ago offered the \$5,000 prize for an aeronautical motor competition, visited the Aero Club of America last week. He called attention to the situation in Great Britain in the matter of aeronautical motor construction. He showed that there was a very large market for American motors, and one of the reasons for this was the fact that many of the manufacturers would be able to release their experts for other more important work at the front if the supply of engines from America was sufficient to meet the demands.



One of the two biplanes of the Aviation Section of the Nebraska National Guard.



### Martin Tractor Used in Making Record of 9 Hours, 48 Minutes

On Friday, September 17, 1915, Lieutenant Walter R. Taliaferro, Aviation Section, Signal Corps, U. S. A., in Signal Corps Aeroplane No. 31, Martin tractor, equipped with Curtiss OX motor No. 525, established a new American endurance record of nine hours and forty-eight minutes. He ascended from North Island at 5:18 A. M. under adverse weather conditions and flew practically this entire time at a height of approximately 600 feet. The first two or three hours' flying was done at a height of about 200 feet in order to keep below a low hanging fog bank. He landed at 3:06 P. M., due to the failure of the gasoline supply system. During the flight his machine consumed forty-six gallons of gasoline. Lieutenant Taliaferro flew to the last moment and landed only after his motor had stopped. It is estimated that this flight over a closed area covered a distance of approximately 500 miles. This record had up to this time been held by First Lieutenant Byron Q. Jones, Aviation Section, Signal Corps, U. S. A., with a duration of eight hours and fifty-three minutes. Lieutenant Jones established his record on January 15, 1915.

Interest in cross-country flying, which has always been great, has been increased if that be possible by the idea existing at the Signal Corps Aviation School of making the aeroplane as practicable as it can possibly be made. Whenever anything whatsoever is to be done, it is done by aeroplane if that be possible. Of late a number of pilots have made cross-country flights to the various California pleasure resorts, flying to these places in the morning, having lunch at some hotel, and flying back to the school in the afternoon. On September 15, 1915, Lieutenants Kilner and Gorrell, in Signal Corps Aeroplane No. 31, flew from Del Mar to North Island in San Diego Harbor in a period of twelve minutes. The distance, measured by air line, is eighteen miles. To have covered this distance by any other route would have required more than one hour, and due to the boat schedules, traffic regulations, time tables, etc., it usually requires about two hours to make this trip by any other means than by aeroplane.

First Lieutenant John F. Curry, Fifth Infantry, reported at the Signal Corps Aviation School on September 19, 1915, for duty as an aviation student.

### California News

Herbert Munter has returned to Seattle and is carrying passengers between Seattle and Tacoma.

Major Alberto Salinas, his secretary and mechanic, Santana called at the Christofferson Aircraft Co. on business last week. Major Salinas is a cousin of Caranza, and has charge of the Caranza aviation department in Mexico.

Harold Blakley, the California aviator who was reported killed in an aeroplane accident last season while flying for the Baldwin Aeroplane Co., is well and doing another line of work in New York. This will be interesting to Mr. Blakley's many friends in San Francisco.

H. Unno, the Japanese aviator, writes from Japan that one of the navy flyers flew a hydroaeroplane eleven hours, non-stop, and that great interest is being taken in aviation all through the Orient.

Holmes and Williams opened an aeroplane factory at Osaka with Japanese aviators as workmen, and are finishing an order for the Chinese and Russian governments.

### Sturtevant News

Mr. H. E. Morton, Chief Engineer of Gas Engine Design of the Sturtevant Aeronautical Department, has recently



Lieut. W. M. McIlwain, U. S. A. Marine Corps, in a Curtiss hydroaeroplane.

completed a series of exhaustive tests on the Model 5 eight-cylinder 140 h.p. exhausts.

New motors as received from the assembling room were placed upon the test stand, being directly connected to accurately calibrated dynamometers. After a preliminary run of a few minutes at 1,600 r.p.m., the throttles were opened wide and the engines turning at 2,000 and over, as was actually the case in each instance, were allowed to run for twelve hours without a stop. The motors completed their runs with a perfect score and upon being disassembled for inspection were found to be in perfect condition. Furthermore, they not only developed their rated h.p. of 140 at 2,000, but actually developed 147 h.p. at 2,200 r.p.m. This point is worthy of consideration because it is a well-known fact that the majority of motors do not develop their rated h.p. and in many cases fall far below.

The first of October finds the production of the motors firmly established on a basis of four per day. Shipments which have been made at the rate of one per day up to the present time will shortly be increased to keep pace with the above output. Several new orders have been placed within the last six weeks and the present situation seems to indicate that the works will have to be run day and night during the coming winter in order that the production output of ten motors per day, which is the aim of the B. F. Sturtevant Co. at the present time, may be fulfilled.

Mr. Harry Payne Whitney's Burgess-Dunne hydroaeroplane in its initial tryouts at Roslyn, Long Island.





## "CHIEF OF STAFF, DEPUTY-PRESIDENT-GENERAL" MORTIMER DELANO'S SCHEME, GAUDY TITLES, COMMISSIONS AND "ORNAMENTS" CAUSE COMPLAINTS

WE have received numerous complaints about "Chief of Staff," Mortimer Delano, who has gained much notoriety in the past two years by his lavish distribution of military titles and commissions, which he awards by authority of a self-invented, non-existing "Aero-Military War College of America," and who has evolved a new scheme to create titles, commissions, gaudy uniforms and "ornaments." (We quote "ornaments" from a circular letter from a Broadway uniform maker, who advises that it has been appointed "official makers of the uniforms and uniform equipments for the officers and members of the First Aviation Corps" by "Colonel Delano, chairman of the Uniform Committee," and will sell "commissioned officers uniforms," including "ornaments" for \$27.75; and "Privates and Non-Commissioned Officers' Uniforms"; also "including ornaments" for \$23.40.)

The new scheme is called "The Aero Military Service Federation of America," and the titles of the officers are truly flashy and gaudy enough to make a blind man blink. They are "president-general; deputy-president-general, secretary-general, deputy-secretary-general, treasurer-general, deputy-treasurer-general."

Mr. August Belmont, whose name has been given out in connection with the "president-generalship," states that he is *not* connected with this scheme, and W. G. Lambert, a mechanic in wood and iron, of Lake Charles, Louisiana, who is given in an "official order" as having been "authorized by the Board of Superior Control" to form an "aero company," has written to the Aero Club of America a letter that would be amusing if it were not so pathetic.

He says in part:

I wrote to Mortimer Delano, "Commander-in-Chief," for rules, regulations and conditions for volunteer aviators. In time I received this:

"You are commissioned and assigned a member as follows: Squadron New Orleans, La., with rank of Captain, grade Military Aviator, to represent this corps in Louisiana, acting Captain Pilot for aviation and recruiting purposes." Signed, Mortimer Delano, C. C. in C.

Now, to judge from all this, I am a commissioned U. S. Officer, P. F. V. Aviation Captain. Good and well. But what are my duties, and have I the legal right to represent myself as a U. S. Officer and Captain to other Military officers, or is it only a polished rank, without much about it, and perhaps some other regular Officer might make fun about me, me calling myself Captain.

Now I wrote to Mr. Delano what are my duties, rules or regulations, and what rights have I to enlist other militia to build up a Unit, but till now I haven't heard a word from him. Then I wrote to the commanding officer at Fort Sill, Okla., to let me know what my rules and regulations are, or would be, and still no reply. I believe ALL make FUN of my Rank of Captain.

You would do me a great favor if you would inform me where I can secure the necessary information as to my duties and what my position would be in general use with the word captain-pilot-military aviator. I suppose to be it, and still don't know, perhaps may make myself a laughing stock to other regular military officers, and that is what I don't care. If I am really in Rank in U. S. Gov., then I must know, etc., etc.

Other complaints are similar in character, more or less like the following, which comes from a prominent man who feels that we are to blame for not making public before now the conditions contained in his complaint. He says in part:

Through what I consider is due partly to your failure to print a warning, I have become involved in that \* \* \* Delano scheme. So I am going to ask you, for the good of aeronautics, and in justice to myself, to make public these conditions. \* \* \*

I received a number of communications signed by Delano, whose titles changed with each letter, being "Chief of Staff" in some, "Commandant" in others, "Acting Colonel-in-Chief" in others, and lastly, "Deputy President-General."

The first communications stated that the "First Aviation Corps" was "organized by act of Congress," and the letter-head stated that it was "Instituted by the Aero Military War College of America." The names of Major-General O'Ryan, General Hamilton, Colonel Bridgman, of the New York National Guard, and Brigadier-General Scriven, Chief of the U. S. Signal Corps., and Brig.-General Mills, Chief of the Militia Department, at Washington, were given as the fathers and advisors of this scheme.

At first I thought I had overlooked an important development and very humbly confessed of being unqualified to accept the high position offered to me. Then many peculiar signs caused me to inquire, and I found that there is not the slightest particle of truth in any of the above-mentioned claims.

The act of Congress referred to provides for the organization of aviation corps by the War Department and I understand that it is close to criminal to use it as was used to interest me, just as it would be close to a violation of Par. 241 of the Military Law of New York, to attempt to form an organization such as this Delano claims to have formed.

As for the "Aero Military War College of America," it does not exist. It is a myth, imagined by this Delano, and it has misled unsuspecting people as it mislead me.

And there is absolutely no truth to the claim that any of the above mentioned officers have fathered or participated in any way, in this absurdity. They were interested in 1912-1913, when reports stated that the Aero Club of America was fathering a movement to interest the militia authorities in organizing aviation corps, but then it came out that the Club itself had been duped by claims that the above-mentioned authorities were fathering the movement, and the interest came to an abrupt end.

Since then the State and Federal authorities and the Aero Club of America have maintained an attitude of dignified silence towards this matter—a commendable attitude in a way, since it would only lend dignity to an absurdity to notice it, but quite harmful when it leads to people being misled, as in my case. Their silence is explained by Delano as an expression of "jealousy." This is what he volunteered to me when I inquired whether he had the co-operation of the heads of the army aviation department and the militia authorities. To convince me, when I requested him to discontinue using my name without my consent, he also stated that he was working on a plan which would result in doing away with the officers who are aviators in the army, and would replace them with men from his (Delano's) corps, and a number of Congressmen had promised to introduce a bill to carry out this plan.

In a statement which he circulates he states:

"We are authorized in time of war to form aviation regiments, per Hay War Volunteer Bill of 1914." There is, of course, no foundation for this. The following warning accompanies this statement:

"On accepting your appointment to membership in this corps (no elections) you are presumed to take the oath of "allegiance" to the Federal Government (no State control) and assume a duty to the nation. And, furthermore, your loyalty to the corps is expected to the highest degree. Those who violate this loyalty will subject themselves to dismissal or discharge without honor."

Could absurdity be carried to any higher degree?

In my investigation I find that most people in the aeronautical movement consider the matter a huge joke. I consider it an evil, and believe it your duty to stamp it out by publicity to these facts. During my investigation I found that three editorials were printed in the *Army and Navy Journal* touching on different phases of this evil, and would advise you to print them."



WARNING

Numerous complaints have been received by the Aero Club of America from people who have paid sums ranging up to \$500 to a certain party under the following circumstances:

This individual, whose business card states that he is Captain of a so-called Aero Military Service Federation of America, has been claiming to be in charge of a plan to open an aviation school in the West for the said "Aero Military Service Federation of America" where, he stated, men will be trained to pilot aeroplanes and will be given a "commission" in the said "Aero Military Service Federation of America." This individual claimed that Mr. August Belmont is financing this proposition, and that tuition would be free, and thereby attracted young men who would like to learn to fly and be of service to their country. The complaints state that he managed to get sums ranging up to \$500 from the applicants and then disappeared. Two young men connected with prominent New York families, who took his promises in good faith, also left

their positions—and now, after losing several months of time, they cannot find said "Captain."

Mr. August Belmont, who is a member of the Aero Club of America, has written to the club stating that he does not know this individual and is not connected in any way with the said "Aero Military Service Federation of America."

A receipt given by this individual to his victim reads as follows: Received from \* \* \* the sum of Three hundred and fifty dollars (\$350) in return for which I agree to take him to Los Angeles, where I shall teach him to fly an aeroplane and guarantee him his pilot's license. While he is learning to fly he is to receive Two dollars per day (\$2), and after becoming a licensed pilot he is to hold the rank of First Lieutenant in the First Aviation Reserve Corps and receive a salary of \$40 per week. Besides this, all his expenses from here to Los Angeles and return, as well as his board and lodging while in Los Angeles, are to be paid.

(Signed) CAPTAIN \* \* \*

Having the editorials referred to before us, together with other newspaper stories exposing the Delano "evil" we realize that if those *exposés* did not make Delano desist there is little hope that anything that we might say will bring the expected results.

One of the editorials, which appeared in *The Army and Navy Journal* for July 18, 1914, reads as follows:

We have received from a former officer of the New York National Guard a vigorously worded protest against the issuance of "commissions" in the "First Aviation Corps" by "Colonel" Mortimer Delano. This former Guardsman writes: "As a former officer in the National Guard and as one interested in aviation work as it affects the military, I should like to enter my protest against the presumptions of Mr. Delano, who has no military training, has held no commission, and has had no experience in practical aviation work. Do you not think that this promiscuous assumption of military titles and the wearing of unauthorized military uniforms should be restricted?" With this protest was inclosed a copy of one of the "commissions" issued. Although printed on the cheapest of cardboard, this "commission" bears a series of titles that would do justice to a commission in the German Army. At the top of this piece of cardboard appear these cabalistic words: "First Aviation Corps, The District Center Provisional Federal Volunteers, Eastern Division, Instituted by the Aero-Military War College of America." Further along in this precious document is this announcement: "Per recent enactment of Congress:—Military aviators, junior military aviators and aviation students." All this jumble of words seems designed to attract those who are easily flattered with high-sounding titles, even though they may mean nothing. The "commission" bears the signature of "Mortimer Delano, Acting Colonel-in-Chief." We have previously had something to say of this scheme to mislead the uninitiated, and have expressed our opinion of the practice of assuming unwarranted military titles. With this "commission" is inclosed a circular announcing the "appointment" of a certain Broad-

way firm as the "official uniform makers of the corps." Who knows but that we shall soon see in the windows of Broadway concerns such signs as "By special appointment of Colonel Delano," after the manner of the announcements of royal patronage, to be seen in London? There is one aspect of this matter that is worthy the attention of those who are officially interested in the success of aviation. Young men who may have a real desire to become military aviators may be induced to join such unauthorized organizations, and after finding that they have been fooled may become alienated from that line of military activity forever, the State or the Federal Government thus losing good material for an aviation personnel.

We publish herewith a reproduction of one of the "Commissions" issued by "Chief of Staff" Delano, showing how he "prints" W. Lanier Washington's name and the claim to have been instituted by the self-created, non-existing "Aero-Military War College of America." This is the "commission" referred to in the caustic editorial of *The Army and Navy Journal*.

The following is part of an article which appeared in the *New York Sun* for October 11, 1914:

AIR CORPS OF 5,130 MAY FADE IN AIR.

"COLONEL" DELANO FACES PERIL OF DESERTION AFTER HANDING OUT AIRY TITLES.

EVERY MAN AN OFFICER.

"For I'm the Colonel, the Chief of Staff,  
And the corps of our Aero Squad,  
So whether or not we've hangar or craft,  
We've a helluva squad—or wish we had."

—From the *Musings of Mortimer*.

The publication \* \* \* of "General Reports of the First Aviation Corps," by "Colonel" Mortimer Delano, Chief of Staff, with a mythical enrollment of 5,130 officers and men—  
(Continued on page 90)



THE FIRST AVIATION CORPS

The District Centre

PROVISIONAL FEDERAL VOLUNTEERS

Eastern Division

Instituted by The Aero-Military War College of America

Consisting of 12 Aero Squadrons with Infantry Sections divided into the 1st, 2d and 3d Provisional Aviation Regiments with Regimental Controls in Boston, New Haven, New York (Long Is.), Albany, Rochester, Buffalo, Newark, Philadelphia and Cleveland. Board of Superior Control, MORTIMER DELANO, Chief of Staff.

CORPS HEADQUARTERS, NEW YORK

Office of Administration

Date July 24<sup>th</sup> 1914 Centre New York Long Is. At Garden City L.I.  
Name \_\_\_\_\_

YOU are commissioned and assigned a member as follows:

Squadron Headquarters Under Major Chief Technical Officer  
With rank of Major and Grade of Corps Staff

PER RECENT ENACTMENT OF CONGRESS:—Military aviators, Junior Military aviators and Aviation students.  
(Also Field Squadron and Flight commanders and Staff officers)

W. Lanier Washington Lt. Col.  
Corps Chief of Administration.

Approved Mortimer Delano  
Acting Colonel-in-Chief.



## THE 225 H. P. SUNBEAM-COATALEN MOTOR

IT is one of the fallacies dearest to the heart of the average engineer that, having once evolved an efficient mechanical contrivance to serve one definite purpose, he can proceed to apply it with equally good results to any other apparently similar object. Thus with the motor engineer and aero engines. Years before the birth of aviation quite good and reliable motor-car engines were in existence; certainly they have been vastly improved since; yet, but for the fallacy in question, they should, with a few unimportant and obvious modifications, have been rendered adaptable many years ago to aeroplane propulsion. In point of fact they were not, and every student knows nowadays that the want of a suitable motor, and this want alone, retarded the development of aviation for years.

The reasons why a motor-car engine is not suitable, unless practically redesigned throughout, are many and various, and too complicated to be discussed here. The necessity for lightness was, of course, the first consideration and brought about the abolition of the fly-wheel and a consequent increase in the number of cylinders to produce even running. On the other hand, the enforced lightness of the reciprocating parts prohibited a very high number of revolutions, the more so since in flight, and even on the ground, the aeroplane motor is subjected to intense vibration, while the constant alterations in the velocity of the relative wind encountered by the propeller also place a heavy strain on the engine. On the whole, however, these various difficulties have now been satisfactorily overcome, and with the advent of high-powered engines, the necessity for which this war has so clearly shown, the weight per brake horse-power and, even more important still, the general reliability have been greatly improved.

One of the newer standard types of the high-powered British aero-engine is the 12-cylinder 225-h.p. Sunbeam-Coatalen, designed by Mr. Louis Coatalen, which is now produced as a larger edition of the 150 h.p. eight-cylinder type.

These cylinders are disposed in Vee formation in *en bloc* castings in four sets of three at 60° on the crank chamber. They are made from a special grade of cast-iron, enabling the water jackets to be cast extremely thin, at the same time maintaining strength.

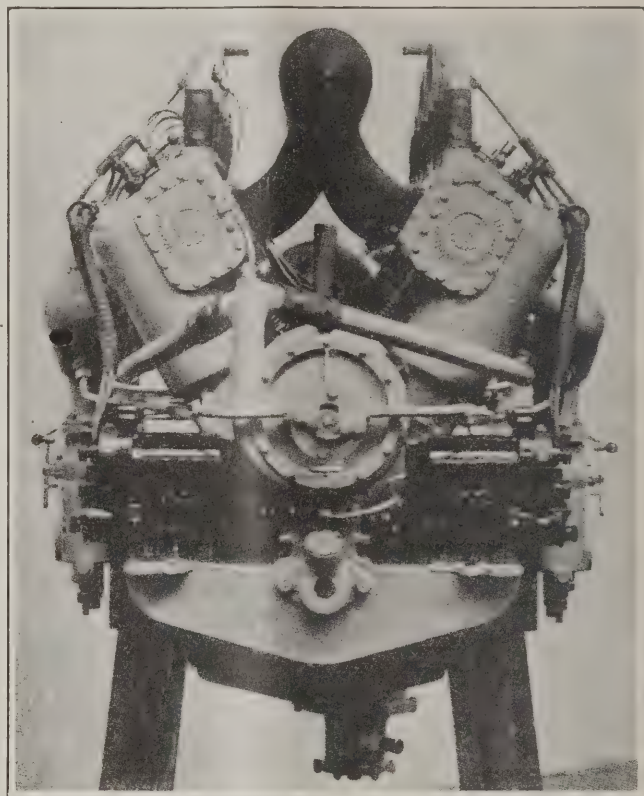
The valves are on the inside of each row of cylinders and are actuated by a single camshaft, which is housed in the top of the crankcase, between the two sets of cylinders, and is lubricated by oil fed from the main duct.

The crankshaft is carried by bearings, between each throw, of large diameter. The connecting rods are arranged so that the big ends are side by side on each crank throw. The opposed cylinders are staggered in relation to each other to allow this. Water circulation is by gear-driven centrifugal pump. Two magnetos are fitted, each operating one row of six cylinders.

Lubrication is forced by a gear-driven pump, which is fed direct from an oil tank separate from the engine. This forces the oil to the main bearings, and from thence it passes through the hollow crankshaft to the big end bearings. From

these bearings it is splashed to lubricate the cylinder walls, after which it returns to the sump through a filter of large dimensions, and is returned by a secondary pump to the oil tank, so that it is not exposed to the heat generated in the crankcase for any length of time. It thus retains its lubricating properties, enabling the oil to be used over and over again.

The engine is fitted with a reduction gear of 2-1, enabling a large propeller to be used at a slow rate of revolution with

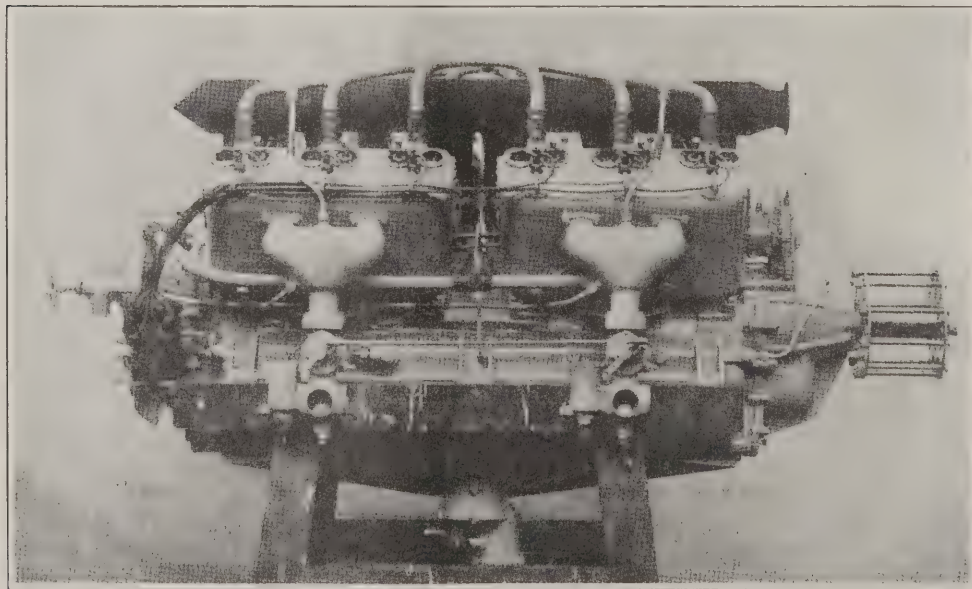


great efficiency; at the same time a very even torque is imparted by the engine to the propeller.

The reduction shaft is specially mounted on substantial ball bearings, and is provided with a special design of thrust bearing, thus allowing the engine to be used for either a tractor or a pusher type of machine without alteration to the design.

Materials only of the very best grade and selection are

(Continued on page 91)



225 h.p. (12 cyl. type) Sunbeam-Coatalen Aircraft motor.



# THE RIGID DYNAMICS OF CIRCLING FLIGHT

The Third Wilbur Wright Memorial Lecture Delivered  
before The Aeronautical Society of Great Britain.

By Prof. G. H. Bryan, Sc. D., F. R. S.

(Continued from last week.)

## IV.—STRAIGHT PLANES WITH BOXED-IN ENDS OR VERTICAL PARTITIONS.

8. This is an arrangement seen in many early aeroplanes (compare Fig. VII., p. 143). If these auxiliary surfaces are not raised, but situated in the axis of  $z$ , the effect is to produce a force along this axis represented by the term  $-wZ_0$  only. If  $T$  is the total area of these surfaces, however, the exact expression according to the sine law is

$$-K^1 T \Omega \sqrt{(a^2 + c^2)} \times \sin \phi \cos \phi \quad (12)$$

Substituting in (5w) we now have

$$-W a \Omega^2 / g + W \tan \phi = -K^1 T \Omega^2 c \sqrt{(a^2 + c^2)} \quad (13)$$

With  $a\Omega = U$  and the help of the equation of equilibrium in rectilinear motion, this gives

$$\tan \phi = \frac{U^2}{ga} - \frac{U^2}{U_0^2} \frac{c \sqrt{(a^2 + c^2)}}{a^2 \sin \alpha \cos \alpha} \frac{K^1 T}{KS} \quad (14a)$$

so that the value of  $\sin^2 \phi / \cos \phi$  given by (6w) will now have to be multiplied by the additional factor

$$1 - \frac{g}{U_0^2} \frac{c \sqrt{(a^2 + c^2)}}{a \sin \alpha \cos \alpha} \frac{K^1 T}{KS} \\ = 1 - \frac{c \sqrt{(a^2 + c^2)}}{2ha \sin \alpha \cos \alpha} \frac{K^1 T}{KS} \quad (14b)$$

where  $h$  is the velocity-height corresponding to  $U_0$ . It is evident that by making  $c$  considerable and  $a$  small this equation can be reconciled with (8p) without making  $\phi$  too large. In this case the pressure on the fins has a considerable effect in maintaining the curved path. On the other hand, if we wish to make  $a$  large the angle  $\phi$  will necessarily be large by (8p) and equations (14a) (14b) will only be satisfied by making  $c$  negative, so that the aeroplane now turns about a point behind its centre of gravity. It would thus appear that while the inclination  $\phi$  and radius  $a$  are connected by (8p) there are two ways of balancing gravity and centrifugal force in describing a circle of radius  $\sqrt{(a^2 + c^2)}$ ; one being to make  $a$  and  $\phi$  small, when the aeroplane will turn about a point in front of its centre of gravity and be kept in its circular path by inward pressure on the partitions; the other to make  $a$  and  $\phi$  large, when the aeroplane will turn about a point behind its centre of gravity and will be kept from falling inwards by the outward pressure on the partitions. In Case I., which represents the limiting form of Case III., for which  $T \rightarrow 0$ ,  $c$  does not enter into the equations of equilibrium and its value is therefore only determined by the value of  $\sqrt{(a^2 + c^2)}$  the radius of the circle to be described. For any given radius greater than  $a$  there are therefore two values of  $c$  which are equal and opposite.

9. Now I have worked out the solution of the simultaneous equations (8p) (14a) on the assumption that  $\sqrt{(a^2 + c^2)}$  the radius of the circle is to be a given constant  $R$  and that all the other data such as  $U_1$ ,  $U_0$  are constant. The easiest plan is to put  $a = R \cos \theta$ ,  $c = R \sin \theta$  and then eliminate  $\theta$ . The result is a biquadratic in  $\cos \phi$ , and it is easy to verify that when  $T$  is small and  $R$  not too small this biquadratic has at least two real roots which make  $c$  positive and negative respectively, corresponding to the two possible motions. But in the limiting case the equation for  $\phi$  degenerates to (9), and if this is written in the form of a quadratic in  $\cos \phi$ , the product of the roots will be  $-1$  so that one value of  $\cos \phi$  will be negative and greater than unity. This shows that two of the roots of the biquadratic will in general represent impossible values.

Suppose in the first place that  $c$  is positive so that the aeroplane turns about a point in front of its centre of gravity. If then a rudder plane be fixed at a distance  $l$  behind the centre of gravity the pressure on the rudder will tend inwards and therefore tend to prevent the aeroplane from turning about the vertical axis unless the plane of the rudder is turned through an angle whose tangent is greater than

$$\frac{c+l}{a} \cos \phi$$

As, however, we have seen that the value of  $a$  is limited, so that large circles can only be described by making  $c$  sufficiently large, it is clear that difficulties will occur in steering in every case.

Next suppose that  $c$  is negative so that the aeroplane is turning about a point behind its centre of gravity. If this point happens to coincide with the position of the rudder plane the direction of motion of this point will always be tangential to the rudder plane. The circular motion will therefore not be possible if the rudder plane is turned, until the pressure on it is sufficient to satisfy equations (7g). If the turning point is behind the rudder, as it will be when  $c$  is made large, the pressure on the rudder will tend to turn the aeroplane round even in the neutral position, so that it may be possible that the rudder will have to be turned inwards in order to prevent the aeroplane from turning too much in that direction.

The best way out of the difficulty would be to have two rudder planes, one in front and one behind. Theoretical considerations seem, therefore, to point to the conclusion that any aeroplane without raised fins or bent-up wings or *ailerons* may be expected to rock from side to side with a swaying motion, and though it may be quite easy to turn them round for a short distance it would be very difficult to steer them steadily and continuously round a circle of large radius.

## V.—RAISED FINS OR RUDDERS

10. In the previous investigations the main difficulty arises from the fact that the condition  $L_1 = 0$  requires that  $\sin \phi$  shall be proportional to  $a$ , in other words, that the couple  $(B - C) \sin \phi \cos \phi \Omega^2 / g$  becomes small in comparison with  $-\Omega \cos \phi L_4$  when  $\phi$  is small and  $a$  large. The difficulty could of course be overcome by the use of raised auxiliary surfaces by means of which a suitable couple  $L_1$  could be impressed on the system. Inasmuch however as  $L_4 = -M_4 \cot \alpha$  and that  $a$  is small it will be seen that the couple necessary to produce this effect would be large compared with the couple  $M_1$  required to produce equilibrium of moments about the axis of  $y$ . If a single auxiliary plane were used for both purposes, its height would have to be large in comparison with its horizontal distance behind the centre of gravity. The difficulty is very similar to that described in connection with the effect of a single vertical fin on stability (§78). So far as it is a mere question of reconciling the two conditions (5p) and (5q) any difficulty could be got over by the use of two auxiliary planes instead of one. On the other hand, the comparative largeness of  $L_4$  makes any

such attempt undesirable in view of the assumed objection to setting up large stresses in parts of the machine that are remote from the lifting surfaces. This objection is not as bad, however, as might be otherwise supposed, because when  $\Omega$  is small the stresses are in no case large, whereas when the aeroplane is turning round a sharp curve, the term  $(B - C) \sin \phi \cos \phi \Omega^2 / g$  becomes operative, and for very sharp curves it may even be necessary to apply a couple in the reverse order owing to this term becoming larger than is required to maintain equilibrium of moment about the axis of  $z$ .

In view, however, of the fact that stabilisers can be substituted for fins, and that these and bent-up wings can certainly produce at least the same variety of effects that are obtainable with fins, it is no longer necessary further to discuss the effects of auxiliary surfaces remote from the main planes.

## CHAPTER III.

### Bent-up and Curved Planes.

#### VI.—BENT-UP PLANES

11. The formulæ for the resistance-derivatives of a pair of bent-up wings of § 75, p. 125, and § 95, p. 154, can be most easily adapted to the present purpose by assuming the origin used in calculating them to be the point in the axis of  $z$  about which the machine turns. The value of  $x$  at the centre of gravity will thus be the distance of this turning point behind the centre of gravity and will be equal to minus  $c$  of the previous investigations. At the same time as the equations of motion are to be referred to the centre of gravity, it will be necessary to substitute the value of  $M_4 + xZ_4$  given by the formulæ for  $M_4$ . We may write  $x = x_0 + x^1$  where  $x^1$  is the distance of any point on the wing in front of the centre of gravity, and this precaution is necessary if we wish to take account of wings of various shapes such as are found in birds, though in ordinary cases  $x^1$  will vanish and  $x$  and  $x_0$  will be identical. Still, had this term been overlooked at the present stage, there would have been serious risk of mistakes being made in some future investigation. We now obtain

$$o = \frac{N_0}{KU^2} = \int l (mx^1 - ly) dS = \int \mu (x^1 \cos \beta - \mu y) dS^1 \quad (16r)$$

$$\frac{Z_4}{KU} = \int n (2lz - nx) dS = \int \sin \beta (2\mu z - x \sin \beta) dS^1 \quad (16w)$$

$$\frac{L_4}{KU} = \int (ny - mz) (2lz - nx) dS = - \int (x \cos \beta - y \sin \beta) (2\mu z - x \sin \beta) dS^1 \quad (16p)$$

$$\frac{M_4}{KU} = \int (lz - nx^1) (2lz - nx) dS = \int (\mu z - x^1 \sin \beta) (2\mu z - x \sin \beta) dS^1 \quad (16q)$$

or with  $x^1 = 0$

$$\frac{M_4}{KU} = \int lz (2lz - nx) dS = \int \mu z (2\mu z - x \sin \beta) dS^1 \quad (16qr)$$

where  $l = \sin \alpha$ ;  $m = \cos \alpha \cos \beta$ ;  $n = \cos \alpha \sin \beta$ ;  $dS^1 = dS \cos^2 \alpha$ ;  $\mu = \tan \alpha$ . Now it will be seen at once that  $L_4$  can be made to vanish by taking

$$\int (x \cos \beta - y \sin \beta) (2\mu z - x \sin \beta) dS^1 = 0.$$

As in Mr. Harper's theory of "Antoinette" stability, we write

$$x \cos \beta - y \sin \beta = \zeta + \epsilon; \quad x \sec \beta = \rho$$

and obtain

$$x = \frac{\zeta \rho (\rho + \epsilon) \tan \alpha \cos \beta dS^1}{\sqrt{(\rho + \epsilon) \sin \beta dS^1}} \quad (17)$$

This expression is identical with Mr. Harper's limit of stability, p. 163, § 100, equation (183), and the interpretation is very simple. If the rudder is placed in front of this turning point the pressure of the air on it will act on the inner side and its moment will tend to increase the rotation. If the rudder is behind the turning point the moment of the air pressures on it will tend to retard rotation.

The advantage of the bent-up planes will be immediately obvious. Owing to the possibility of making  $L_4$  small the value of  $\sin \phi / a$  required by the equation of moments about the axis of  $x$  need no longer be constant, and it is thus possible to turn in a circle of large radius without making  $\phi$  large or making the axis of  $x$  tangentially envelop a circle of small radius  $a$ . A small change in the value of  $\phi$  will produce a corresponding change in  $L_4$  and enable us to satisfy the condition (5p), namely,

$$(B - C) \sin \phi \cos \phi \Omega^2 / g = -\Omega \cos \phi L_4$$

It remains to consider the effect on the other conditions of equilibrium, and for this purpose we have to consider particular cases

#### VII.—SIMPLE DIHEDRAL ANGLE BETWEEN RECTANGULAR PLANES:

12. By this we mean to say that the two wings are plane, that they form a dihedral angle  $(180^\circ - 2\beta)$  approximately, but that they are not themselves curved, so that  $\beta$  as well as  $\alpha$  is constant at every point of a wing, and that the shape of each wing is approximately rectangular. In this case factors involving  $\beta$  and  $\alpha$  can be placed outside the signs of integration. It will be seen at once that the conditions for  $L_4 = 0$  and  $M_4 = 0$  become identical if  $\epsilon = 0$ , that is if the dihedral angle is situated at the centre of gravity instead of being raised above it.

Having got rid of  $L_4$  and  $M_4$ , the equation of moments about  $Ox$  gives

$$(B - C) \sin \phi \cos \phi = 0 \quad (18)$$

which is satisfied by  $\sin \phi = 0$  or  $B = C$ .

If  $B = C$  there only remains the equation (5w), which gives

$$\tan \phi = \frac{U^2}{a} \left( \frac{1}{g} - \frac{K}{W} \right) \int \sin \beta (2\mu z - x \sin \beta) dS^1 \\ = \frac{U^2}{a g} - \frac{U^2}{U_0^2 a} \frac{\int \sin \beta (2\mu z - x \sin \beta) dS^1}{\int \mu dS^1 \cos \beta} \quad (19)$$



To obtain the latter form we obtain the value of  $Y_0 = W$  from equation (136y), which gives

$$W = U_0^2 \int k l m dS = U_0^2 K \int dS \cos \alpha \sin \alpha \cos \beta = K \int \mu U_0^2 \cos \beta dS^1$$

We may further simplify these results by taking the formulæ for a rectangle, which give, if  $c$  be the semi-span,

$$\int \sin \beta (2\mu x - x \sin \beta) dS^1 = S^1 \sin \beta (\mu c - x \sin \beta) \quad (20)$$

while the condition  $M_0 = 0$  gives

$$0 = \int (2\mu^2 x^2 - \mu x \sin \beta) dS^1 = S^1 \left( \frac{2\mu c^3}{3} - \frac{x c}{2} \sin \beta \right) \quad (21)$$

Substituting in (19) we obtain

$$\tan \phi = \frac{U^2}{ag} + \frac{1}{3} \frac{U^2}{U_0^2} \frac{c}{a} \tan \beta \quad (22)$$

or if  $U_0 = U$  (as is probably true)

$$a \tan \phi = 2 \text{ (velocity height)} + \frac{1}{3} c \tan \beta \quad (22a)$$

The conditions of perfect inherent controllability are now satisfied, and when the radius of the curve is large the angle  $\phi$  is small. The effect of the air resistance is to slightly increase the angle  $\phi$  required for equilibrium, thus producing a slight addition to the centrifugal force

13. The objection to this particular form of solution is that it would hardly appear desirable to build an aeroplane satisfying the condition  $B = C$ . This would involve the assumption that the mean square of the distances of the elements of mass from the horizontal plane was as great as the mean square of their distances to the right and left of the plane of symmetry. Of course it might be economically possible to secure this condition by means of a large number of superposed surfaces instead of two at the outside, but this arrangement would have considerable inconveniences.

When  $B > C$ , as is the usual case, the condition  $L_1 = 0$  can still be satisfied by varying the position of the turning point. This involves decreasing  $x$  by an amount proportional to  $\sin \phi$ . But the result will be to effect a corresponding change in the value of  $M_0$  which will no longer be zero.

The difficulty could be got over by making

$$F = -(B - C) \mu \sec \beta \quad (23)$$

thus making the equations  $M_1 = 0$  and  $L_1 = 0$  equivalent. The objection to this has been pointed out, namely, that it would disturb the horizontal equilibrium by introducing a couple about  $Ox$ , and this couple would be large compared with the one about  $Oy$  which it is sought to eliminate.

But if the system is provided with a "neutral tail" for longitudinal steering and stability, and this tail is placed at a distance  $l$  behind the centre of gravity or  $l - x$  behind the turning point, the tail will encounter a resistance  $KS_2(l - x)U\Omega \sin \phi$ , as may be seen from the formulæ of § 48, p. 76, and this resistance will have a moment about the axis of  $x$  equal to  $KS_2(l - x)lU\Omega \sin \phi$  tending to tilt the tail up (i.e., in the positive direction). As, however, the couple  $F\Omega^2/g \sin \phi \cos \phi$  also acts in the same direction, it is clear that a negative value of  $F$  will only make things worse, and affect the longitudinal equilibrium more than it would be affected otherwise unless  $l - x$  is negative, that is, unless the tail for longitudinal steering is in front of the turning point, and this condition is likely to be prejudicial to longitudinal stability.

It follows that it is best to make  $F = 0$ . Equilibrium can then only be maintained if pressure be exerted on the controlling rudders.

## VIII.—EFFECT OF A RUDDER BEHIND THE CENTRE OF GRAVITY.

14. The effect of such a rudder will be to produce a force  $Z_1$  and a couple  $M_1$  connected by the relation  $M_1 = lZ_1$ , where  $l$  is the distance of the rudder behind the centre of gravity. These results are, of course, only approximate and conditional on the rudder being only turned through a small angle. If it is turned through a large angle it will also give rise to a resistance, which we do not here consider. The assumed position of the rudder is not such as to give any moment  $L$  about the axis of  $x$ .

The plan on which the following equations are built up is as follows:—

The extra moment in the  $L$  equation due to  $B - C$  is balanced by shifting the turning point from its previous distance to a distance  $x + \xi$  (although this makes  $\xi$  negative it is more convenient not to call the distance  $x - \xi$ )

This upsets the equilibrium in the  $M$  equation and the effect is balanced by the couple  $M_1$  due to the rudder.

The corresponding force  $Z_1$  is made to balance the other forces in the axis of  $x$ .

Finally, when the equations are written down we have three equations to determine the three unknowns  $\xi$ ,  $Z_1$  and  $\phi$  corresponding with circular motion with any given values of the radius  $a$  and velocity  $U$ .

When these substitutions are made and we take account of the fact that  $L_0$  and  $M_0$  have been made to vanish for  $\xi = 0$ , we obtain

$$-W \cos \phi \frac{U^2}{ga} + W \sin \phi = -\frac{KU^2}{a} \cos \phi \left[ \int \sin \beta (2\mu x - x \sin \beta) dS^1 - \xi \int \sin^2 \beta dS^1 \right] - Z_1 \quad (24v)$$

$$(B - C) \sin \phi \cos \phi \frac{U^2}{ga^3} = -\frac{KU^2}{a} \cos \phi \xi \int x \cos \beta \sin \beta dS^1 \quad (24p)$$

$$0 = \frac{KU^2}{a} \cos \phi \xi \int \mu x \sin \beta dS^1 - Z_1 l \quad (24q)$$

and we have already seen from (20), (21), that for rectangular planes

$$\int (2\mu x - x \sin \beta) \sin \beta dS^1 = -\frac{1}{3} \mu c S^1 \sin \beta \quad (25)$$

Also we have, still for rectangular planes,

$$\frac{K \xi b}{2} S^1 \cos \beta \sin \beta = -\frac{(B - C) \sin \phi}{ga} \quad (26a)$$

$$Z_1 l = -(B - C) \sin \phi \cos \phi \frac{U^2}{ga^2} \cos \beta \quad (26b)$$

finally

$$-W \cos \phi \frac{U^2}{ga} + W \sin \phi = -\frac{KU^2 S^1 \mu c}{3a} \sin \beta \cos \phi + (B - C) \sin \phi \cos \phi \frac{U^2}{ga^2} \left[ \frac{\mu}{l \cos \beta} - \frac{2 \tan \beta}{c} \right] \quad (26c)$$

Substituting  $W = KU^2 S^1 \mu \cos \beta$ , which is true if  $U$  is equal to the velocity in rectilinear motion as assumed approximately; writing  $U^2 = 2gh$ ,  $B = W r_2$ ,  $C = W r_3$ , we get

$$-2h + a \tan \phi = \frac{1}{3} c \tan \beta + \frac{(r_2 - r_3) \sin \phi h}{a \cos \beta} \left[ \frac{\mu}{l} - \frac{2 \sin \beta}{c} \right]$$

Since we have found from Mr. Harper's condition of stability that  $\mu/l < \frac{1}{2} \sin \beta/l$  it follows that the last term must be negative and we may write the equation

$$a \tan \phi + \frac{(r_2 - r_3) h}{a \cos \beta} \left[ \frac{2 \sin \beta}{c} - \frac{\mu}{l} \right] \sin \phi = 2h + \frac{1}{3} c \tan \beta \quad (27)$$

These results agree fairly well with what one would naturally expect from general considerations

An alternative method is, of course, to use *ailerons*, the action of which can be made to produce an arbitrary couple, which couple will be denoted by  $L_1$  in equation (5p) and will occur in all the equations of moments about the axis of  $x$ , such as (6p), (23), (24p).

## IX.—CURVED WINGS.

15. The fact that it is impossible to obtain perfect inherent controllability in the previous case follows from (20), (21), which show that it is impossible to make  $M_0$  vanish without making  $Z_0$  negative. Although we have considered only the case of rectangular plane surfaces, a familiarity with integration formulæ and properties of moments of inertia will show that the same is necessarily true for wings of any shape provided that  $\mu$  and  $\sin \beta$  are everywhere constant, that is, that the wings are plane surfaces with a single dihedral angle between them. If, however,  $\mu x$  is proportional to  $\sin \beta$  the integrals for  $Z_0$  and  $M_0$  are proportional so that if one vanishes the other vanishes too, as may be seen from (16w), (16qr) or (20), (21).

This leads to a very important conclusion, namely, that **curved wings may behave in a totally different way from a pair of straight planes with a single dihedral angle in the case of circling motion**

If then, to go a little further, we make  $\sin \beta/x$  increase as we go outwards towards the extremities of the wings, we shall be able to make  $Z_0$  positive, and thus to balance the term  $-W \cos \phi \Omega^2/g$  in condition (5w) which will therefore be satisfied by making  $\phi = 0$ .

It thus appears possible with curved wings to design an aeroplane which will turn perfectly freely in any circle without canting over to one side.

The problem may be varied in many different ways, by taking not only  $\beta$  but also  $a$ ,  $x$  and  $dS^1/dx$  to be functions of  $x$ . In this way it is possible to extend the calculations to wings of any shape whose curvature follows any assumed law. It would be an interesting exercise to perform the calculations with different assumed functional relations between the several variables, and to trace the shapes of the wings so obtained. Such calculations would at least be as useful as the great majority of the papers which swell the pages of our mathematical journals and there should be no difficulty in finding cases where the integrations are simple.

By putting  $h = U^2/2g$  and substituting from the conditions of equilibrium, we obtain for the equilibrium along the axis of  $x$

$$2h \int \mu dS^1 \cos \beta = \int \sin \beta (2\mu x - x \sin \beta) dS^1 \quad (28w)$$

The other equations to be satisfied are by (16)

$$0 = \int (x \cos \beta - y \sin \beta) (2\mu x - x \sin \beta) dS^1 \quad (28p)$$

$$0 = \int (\mu x - (x - x_0) \sin \beta) (2\mu x - x \sin \beta) dS^1 \quad (28q)$$

$$0 = \int \mu \{ (x - x_0) \cos \beta - \mu y \} dS^1 \quad (28u)$$

and in addition we have the geometrical relations

$$dz dx = m dS = dS \cos \alpha \cos \beta = dS^1 \cos \beta / \cos \alpha \quad (29a)$$

$$0 = l dx + m dy + n dz \quad (29b)$$

together with the usual formulæ  $l = \sin \alpha$ ,  $m = \cos \alpha \cos \beta$ ,  $n = \cos \alpha \sin \beta$  (29c)

$$\mu = \tan \alpha, dS^1 = dS \cos^2 \alpha \quad (29d)$$

16. In the next place it is to be observed that no difficulty arises in reconciling (28u) and (28p) with the remaining equations of condition. If these conditions are not already satisfied it is only necessary to displace the wings relatively to the centre of gravity, thus adding arbitrary constants, say  $\xi$ ,  $\eta$ , to the values of  $x$ ,  $y$ , in these equations. It is possible even with narrow wings to assume that  $x$  is constant, so that  $x^1$  or  $x - x_0$  represents the displacement necessary for the purpose, i.e., the constant  $\xi$ . If we suppose  $\mu$  constant and multiply (28p) by  $\mu$  and subtract from (28q) we get

$$\int (2\mu x \sin^2 \frac{1}{2} \beta + (\mu y - x^1) \sin \beta) (2\mu x - x \sin \beta) dS^1 = 0 \quad (30a)$$

while (28u) may be written

$$\int \{ (\mu y - x^1) + 2x^1 \sin^2 \frac{1}{2} \beta \} \mu dS^1 = 0 \quad (30b)$$

(Next week's instalment will discuss "Four-winged" or Tandem Planes and Straight Planes with Terminal Stabilizers.)





# FOREIGN NEWS



## Austria

"On September 24th Austrian aeroplanes flew over Podjervatz, dropping twenty-two bombs and killing three men, but according to Serbian despatches, doing no damage of military significance. On the 25th they again dropped bombs, killing one man.

## Belgium

Belgian aviators, on September 30th, successfully bombarded, under a violent artillery, infantry and machine gun fire, the enemy cantonments at Clercken, Essen and Keyem, and the encampments at Traet Bosch, causing at that point fierce fires.

Airmen of the Allies have bombarded Bruges. The sudden cessation of the flow of gas at Sluis (in Zeeland, on the Belgian frontier), which is supplied from Bruges, led to the suspicion here that bombs from the aircraft struck gas works. A message received later from Bruges confirmed the belief that the gas works have been struck by the bombs of the Allied airmen. The whole city was thrown into darkness, the despatch said.

## Denmark

Apropos the report from Copenhagen that the Germans are making a new type of flying machine, modelled on the Russian pattern, the well-known Swedish aviator and owner of the Soedretge aeroplane factory, Baron Cederstrom, who has frequently been to Germany, has stated to the Swedish press that Germany is making some new large aircraft. The Germans have got some slight idea from the Russians, he says, but the machine as a whole is German.

## France

One hundred and twenty aeroplanes went into the air on September 26th in a spontaneous demonstration of joy over the victories for the arms of the Allies to the north and east. The point from which they rose is one of the railway transfer stations of the Paris Belt Line, and the arrival of ten train loads of German prisoners brought the first indication of the successes. One airman after another rose, waving the tricolor, until 120 machines were manoeuvring.

Lieutenant de Maud'huy, son of Genera L. E. de Maud'huy of the Sixth Army Corps, has been killed by the fall of an aeroplane which he was piloting. He had just completed a course of instruction in manipulation of the machine. Lieutenant Maud'huy was formerly an aeroplane observer. He was well known for having made an attack, single-handed, on six hostile aeroplanes.

A despatch to the Norddeutsche Allgemeine Zeitung states that a French aeroplane landed two spies, provided with plenty of German money, behind the German lines. The spies were captured on the same day.

A French aviator flew over Liège September 28th and threw down in the city French flags and documents containing proclamations announcing that the Allies were advancing and calling upon the populace of Liège to keep up their courage. Although subjected to a heavy fire, the aviator escaped. This is the first visit of an airman of the Entente Allies to Liège since the fall of the city, and his appearance is described as greatly cheering the Belgians there.

French aircraft successfully raided the German communications near Valenciennes on September 27th. A railway train was hit and the line cut in several places.

## Germany

A German Zeppelin operator declares that when the wind is east it is not difficult to float over to London and drop a few alarming bombs upon the complacent populace of that decadent city. When, however, the customary southwester is blowing up the Channel, London is out of range. It has also been noted that when there is what might be termed a head wind, gas declines to go to windward and returns to its dispensers in the trenches. Thus do we see another revolution in the methods of war. Fleets patrol the seas without consideration of the breezes, which have become a factor in the warfare of the land.

Despatches under date of September 28th stated that Riga was being shelled by German aeroplanes, and that important damage was being effected.

At a meeting of the Stuttgart City Council the Mayor and Councilors protested vigorously against the recent French raid upon that city. Burgomaster Lautenschlager asserted that an enemy that attacked harmless civilians was fighting a lost cause.

Flight Sergeant Boehm, who recently distinguished himself for his single-handed attack upon four French aeroplanes, has been decorated with the Iron Cross. Sergt. Boehm is a member of a Bavarian aviation corps. When four French aeroplanes approached Freiburg Boehm rose alone to defeat them. Having no companion, he had to direct his aeroplane and fire his gun. He killed the pilot of one French aeroplane and the observation officer of another. Both aeroplanes were forced to land and the surviving occupants were made prisoners.

## Great Britain

A despatch in the London Daily Spectator states that its correspondent learns from a reliable source in Friedrichshafen that thirty-eight Zeppelins and nine Parseval airships have been lost since the beginning of the war.

The majority of the airships were brought down by the Allies' aerial guns, and the remainder had accidents while landing. The average cost of these airships is more than \$500,000, while the newest models cost nearly double this sum. Therefore, Germany has lost more than \$25,000,000 in a year in her airships, bombs from which have killed and wounded 500 persons.

C. G. Grey, editor of Aeroplane, in dismissing the report that the Zeppelin sheds are being removed from Brussels to Antwerp, offers the suggestion that because of the raids of allied airmen, who are supposed to have destroyed many sheds at Brussels and Ghent, the Germans now park their huge machines at Liège or some point even farther in the interior of Germany, stopping at Antwerp on their way to England to receive fresh petrol and take on their cargo of bombs.

In the drive of the Allies on the Western front the airmen are playing an important part. Attacks were made on the German railway lines south of Lille September 24th. It was by these lines that the enemy would naturally bring re-enforcements from Belgium. A German freight train was wrecked on September 25th and the rails were torn up at several places on the following day, and on Saturday a troop train and a supply train were hit and the tracks were broken at four places. A troop train at Loffre station bound eastward toward Douai was struck by aerial bombs and three cars were wrecked. As the airmen were departing they noticed that the Germans had alighted and had gathered around the wrecked cars. At this the airmen planed down to 500 feet and unloosed a 110 pound bomb into their midst and then rose unscathed. But probably the most important feat of the airmen was their work in setting fire to the railway stations at Valenciennes Junction, a point of vital military importance to the Germans, as here lines from Brussels and Maugeuge meet the lines going to Lille, Cambrai, Tournai and Douai. One German aeroplane is known to have been wrecked and in only one instance did a British aeroplane come off second best. In consequence of the vigor with which the airmen carried the war into the enemy's country the German flying men will no longer meet our men in combat.

## Holland

The Dutch Government has made, through The Hague, a serious protest to Germany concerning the passage of German airships over Dutch territory. Holland declares it expects Germany to take adequate measures to avoid violation of Dutch territory in the future.

## Japan

Japan is planning to establish a military aerial corps on a large scale. The proposed scheme will take effect from this year. The organization of a new aerial corps will be completed in the course of three years, but as the first attempt, the present corps is to be enlarged, and will make the first branch of the proposed corps. The second and the third branches will be gradually established as time goes on. The undertaking for this year entails the expenditure of 98,955 yen, but the amount will not be used for the construction of aerial machines, but will be preserved, at least for the time being, as an emergency fund. The aeroplanes now attached to the Military Aerial Association will be included in the present corps. The Military Aerial Association is to receive an extra amount of 100,000 yen, and the association's total expenditure plus 98,955 yen, just appropriated for the extension scheme for this year, will make the gross total of 400,000 yen—the amount sufficient to provide the army with 50 aeroplanes.

## Serbia

An official statement issued by the War Office, October 3, says: "On Friday seven aeroplanes dropped bombs on Poscharevatz, an open town. A civilian was killed and two soldiers and three civilians wounded. On Saturday the aeroplanes dropped bombs of Kragujevatz. We brought down one of the aviators, who was burned to death in the fall of his machine."



A Zeppelin attack on London depicted by a German artist.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
5730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1363 Townsend Avenue, Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 130, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**HARLEM MODEL AERO CLUB**  
73 West 106th Street, New York City  
**MILWAUKEE MODEL AERO CLUB**  
402 Bradford Avenue, Milwaukee, Wis.  
**CONCORD MODEL CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**AERO CLUB OF ST. LOUIS**  
Columbia Bldg., 8th and Locust Streets, St. Louis, Mo.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

## NATIONAL MODEL AEROPLANE COMPETITION

### Hydro Contest

The following results of the hydro contest sets forth another world's record. This record was made by Mr. Lindsay Hittle, of the Illinois Model Aero Club, whose model hydro-aeroplane remained in the air for a duration of 116 seconds after rising from the water. The establishing of this record clearly sets forth the scientific progress of model aeroplanes which is being stimulated through the efforts of the Aero Club of America.

The results of the contests of the Eastern Clubs fell below what was expected. Irrespective of the fact that there are no places in the near vicinity of New York City for the holding of such a contest, weather conditions during the past few weeks were against the contestants. Mr. Wallace Lauder, holder of the world's distance and duration record, made several attempts to launch his model from an improvised pond, but each time as his model was about to leave the water the pontoons would strike the bank causing the model to overturn, and finally broke both forward pontoons. Other models that did succeed in getting off were caught in gusts of wind and thrown upon the stones, breaking the pontoons and propellers.

### Illinois Model Aero Club

	Best Flight			Total	Aver.
Lindsay Hittle .....	116 sec.	82.4	70.6	269	89.6
Ellis C. Cook .....	100.6 sec.	98.4	57	256	85.3
Ward Pease .....	71.8 sec.	45	0	116.8	38.9
William Schweitzer ..	53.8 sec.	38.8	0	92.6	30.8
Total .....				244.6	
Club Average .....					61.1

### Concord Model Aero Club

	Best Flight			Total	Aver.
William F. Schult... ..	30.2 sec.	29.6	25.2	84.8	28.2
Waid Carl .....	17.8 sec.	12.4	6.2	36.4	12.1
Earl H. Bean .....	24.2 sec.	5	0	29.2	9.7
Benjamin Smith .....	3 sec.	0	0	3	1
Total .....				51	
Club Average .....					12.7

### Texas Model Aero Club

	Best Flight			Total	Aver.
Hamer Smith .....	19.1 sec.	19.1	13.4	51.6	17.2
Dwight Bourn .....	29.1 sec.	21.2	17.	67.3	22.4
Total .....					39.6
Club average .....					9.9

### Harlem Model Aero Club

	Best Flight			Total	Aver.
Harry Schultz .....	37.1 sec.	3.2	2.3	42.6	14.2
A. K. Barker .....	43.4 sec.	39.3	38.3	121	40.3
James Barker .....	(wrecked)				
G. Bauer .....	(wrecked)				
Total .....					54.5
Club Average .....					13.6

The other clubs in the vicinity of New York City competed, but without results. The judges who officiated at the Contest held at Garden City, October 3rd, were Mr. Henry Woodhouse, Mr. G. Douglas Wardrop, Mr. Burt McConnell, Mr. Arthur Heinrich.

### The Orange, N. J., Model Contest

On the evenings of September 30th and October 1st at the Y. M. C. A., Orange, N. J., a number of members of the Aero Science Club gave instructions to a gathering of young men as to the making and flying of model aeroplanes, and on October 9th, in connection with a big rally of the Boy Scouts of America at East Orange, members will give exhibitions of model aeroplanes in flight. It is expected that 5,000 Boy Scouts will take part in the rally. Those members who are expected to represent the A. S. C. at the rally are as follows: Wallace A. Lauder, Harry Schultz, G. Bauer, Chas. Wm. Meyers, R. C. King, Jr., Wm. Hodgins, G. A. Cavanagh, Egbert P. Lott, F. Broomfield, A. K. Barker. The exhibitions will be given during the afternoon exercises. Mr. John Fleming has arranged to send aloft his large kites carrying the banners of the Y. M. C. A. and the A. S. C. The kites will remain in the air during the exercises. Messrs. R. M. Jacobus and H. B. Grant, chairman and secretary of the contest committee, have made arrangements whereby a number of scouts will be curtailed to assist the model flyers.

(Continued on page 90)

The accompanying photograph shows Mr. John Fleming, of the Aero Science Club, standing alongside one of his large kites. These kites are perhaps the largest made in America and are designed to sustain heavy objects such as wireless outfits, banners, etc. Mr. Fleming will send up his largest kites at the coming Boy Scout rally to be held at East Orange, N. J., Oct. 9th. The banners will announce the Model Contest of the Y. M. C. A., Orange, N. J., and the Aero Science Club.







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

Aviator: Do you know, you are so clever and charming and brilliant that I really feel embarrassed in your presence.  
 Aviatrix: But you musn't; really, you musn't.  
 Aviator (reassuringly): Oh, I dare say I'll get over it when I know you better.

#### The Aviator

How sad to be an Aviator!  
 Of Icarus the imitator,  
 He loops the loop to Kingdom Come  
 Propelled by vile Petroleum.  
 Through drizzly clouds of varied sizes  
 Aloft to dizzy heights he rises  
 Until across his path he sees  
 The Mountains' bleak *chevaux-de-frise*.  
 I've never thought his costume dressy,  
 Besides, his death is Awful Messy.  
 And were I he, my lofty song  
 Would scarce have lasted half so long.  
 —Arthur Guiterman.

The Cleveland Leader gives the following six best sellers:  
 Shrapnel.  
 Rifles.  
 Loaded cartridges.  
 Uniforms.  
 Automobile trucks.  
 Cotton.  
 How about aeroplanes?

#### To Lieutenant Warneford, V. C.

BY EMILE CAMMAERTS.

English Version by Thomas Walsh (Courtesy of *Literary Digest*).

A falcon poising lone and lost in space—  
 A cloud his only shield.  
 He marks the monster from the murderous field  
 Its homeward way retrace.  
 Sudden below him shows afar  
 Glistening in the summer's brooding noon—  
 The silken gray expanse of the balloon;  
 Then on that nightmare swoops his car,  
 All Perseus-like against Medusa's might,  
 And cleaves it with his dart;  
 Then watches he its fall.  
 Head downward, flashing light,  
 With thunderous call,  
 To plow the plains apart!

Against a hundred was that single foe—  
 A hornet striving 'gainst a giant's blow;  
 Swept in the whirlwind path its falling cleaved  
 He with unerring hand control retrieved—  
 Then lightly off again  
 Gives Pegasus free rein—  
 He soared away, undaunted, 'mid the flow  
 And space again!

And we, what visions, what high pæans throng  
 At such a deed for song?  
 What master hand, what lyric voice, is here  
 Whose masterpiece hath such perfection sheer?  
 For nobler cause what heart hath ever striven  
 Or nobler deed been wrought?  
 What immortality like this been riven  
 And from Death's very anvil caught?

#### Not Dangerous

"You criticize us," said the Chinese spectator at an aerial meet, "yet I see all your women have their feet bandaged."  
 "That is an epidemic," it was explained to him gently, which broke out in 1914. Those are called spats"—*Washington Post*.

#### Usefulness of Zeppelins

The holes made by bombs dropped onto London by German airships, according to the *New York World*, are being used by the farmers in a very practical manner. These farmers come in from suburban towns and hang around the city, and whenever a bomb falls and digs its way into the earth they immediately shovel out the newly made hole, put it onto a waiting truck and cart it up to the farm. The holes are used by the farmers for wells, and this saves considerable time digging, as the holes are merely shoved into the ground. Some of the holes are from eight to ten feet long. Sometimes bricks are built around them and they are used for chimneys. Other times they are cut up into small pieces and used for bungholes. warfare.

#### Safety First

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By J. H. Cassal



Courtesy N. Y. Evening World.



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(Continued from page 83)

mostly officers—few, if any, of whom have ever been persuaded to leave terra firma in any kind of air craft, is likely to produce, besides a volume of laughter, more desertions of hitherto unsuspecting Colonels, Captains, Majors and others of high degree, from Colonel Delano's personally conducted corps than even his mile a minute rate of conscription can hope to overcome. In fact, as far as bona fide aviators are concerned, the "Colonel," also erstwhile member of the Aero Club of America—but no more—is likely to find himself quite alone, abandoned, solitary, and, as it were, by himself.

The Aero Club, as a Club, was the first to desert Colonel Delano's ethereal brigade, . . . the Empire State and Government refused to coddle the "Colonel's" ambition to organize and head the "First Aviation Corps," and turned "him down cold." Then the Government asked the Club to please apply the brakes to the rapidly conscripting forces of Delano, and to Delano's search for military fame. Result: A hasty meeting of the Board of Governors and the subsequent "resignation" of "Colonel" Delano, who gets his title, it is understood, from having been a member of the Veteran Corps of Artillery.

But that was just the beginning. A lot of aviators and others interested in aviation, who "kidded Delano along," as well as quite a few newspaper reporters, salesmen of various sorts of things, were grabbed up by the Colonel, who gave them overnight, the titles of Colonels, Adjutants and Captains.

Several Captains are said to know nothing about their commissions. An Adjutant and Lieut.-Colonel are said to be using their commissions to help sell things on the road.

This is not an ordinary corps, you see. In fact, it is quite extraordinary in every way. Few, if any, of the Captains, Colonels, Lieutenants and Majors were ever up in the air except when they tried to argue the Military Committee of the Assembly into passing a bill creating them officers when they had neglected to take a short cut through the National Guard. And again when they carried their fight for recognition to Washington, and the Government officials afforded recognition by the well-known method of "giving them the gate."

If the officials only knew, and perhaps they do, what an impetus they gave to the imagination of the Field and Staff Officers of the "District Field Center" by such effrontery to "Colonel" Delano and his corps of mechanics, salesmen, others and some unsuspecting real aviators, here's a bet that these titles would not be handed out so freely.

And that mysterious line mentioned, where this began, would not now be protected by 5,130 officers of the "First Aviation Corps" daily saluting each other as General, Major, etc., and at the same time trying to locate a General with a real aeroplane or balloon, a hangar and a place to drill twelve mythical squadrons.

Further comment is unnecessary, but we wish to state that AERIAL AGE condemns in the most whole-hearted manner the promiscuous use of military titles by unqualified persons. It is an injustice to the military man who has spent years in earning his commission, and undesirable from every standpoint.

This is but one of numerous complaints. We trust to not have to publish more. Having so much constructive work to do we dislike having to spend time and space on such matters.

### The Flemming Pathfinder Aeroplane Kite

(Continued from page 88)

The following is a description of the "Pathfinder Aeroplane Kite": It is constructed on the Pathfinder Aeroplane system of design, with modifications to apply to a kite. In designing the kite Mr. Flemming endeavored to follow as closely as possible the ideas of Professor Langley and Sir Hiram Maxim.

The kite has a tandem set of planes connected by a longitudinal plane, which is tunnelled. The forward plane has a spread of 14 feet and chord of 2 feet 9 inches. The rear plane has a spread of 12 feet and a chord of 2 feet 9 inches. The longitudinal plane is 11 feet 6 inches long and 2 feet 9 inches wide. It extends 1 foot beyond the forward plane and 1 foot 6 inches beyond the rear plane. It is tunnelled by means of two triangular cones, the forward cone being 2 feet 9 inches long and 2 feet 9 inches deep; the rear cone 4 feet 3 inches long and 2 feet 9 inches deep. The cones are connected by two strips of oak 10 inches deep and 3 feet 6 inches long.

Heavy, reinforced silkline is used for covering. Four 22-inch pieces of 28-gage steel tubing, 1 inch in diameter, are



used to connect the 1-inch oak sticks used for the planes. These are bolted with brass eye thumbscrew bolts with lock nut; 120 feet of Roebing flexible steel wire is used for the bridle, to which is attached a bridle ring 1/2-inch thick, 3 inches in diameter; 2,250 feet of special 5-16-inch Columbian hemp rope is used for line.

### Illinois Model Aero Club

By WARD PEASE.

Saturday, October 2d, the Illinois Model Aero Club held its elimination meet in R. O. G. models at Cicero Flying Field. The results were as follows:

Cook .....	95.0 sec.	96.6 sec.	131.0 sec.
Pease .....	110.4 sec.	75.4 sec.	101.0 sec.
Lathrop .....	62.6 sec.	83.0 sec.	
Hall .....	55.2 sec.	61.0 sec.	68.8 sec.
Lucas .....	49.6 sec.	58.0 sec.	53.0 sec.

Hittle, Schweitzer, and Wrixon were also present with models and will be on the reserve, although hard luck prevented them from making good flights. The finals come October 16th and it is expected that a good average will be made.

Saturday, September 25th, several of the I. M. A. C. boys flew their models in Washington Park as a demonstration for Mr. W. S. Daily, director of Russel Square, and several boys from the vicinity of the Square, who have become interested in models through drawings recently published in *Popular Mechanics*. With the aid of the I. M. A. C. it is expected that they will soon be building successful models.

### A Correction

The following is the correct average of the Pacific Northwest Model Aero Club's results in the first contest of the National Model Aeroplane Competition. The average which appeared in the issue of September 20th was printed in error.

	Total.	Average.
Robert La Tour.....	5,815	1,938
Lawrence Garrick .....	3,663	1,221
Leon Dover .....	2,867	995
George Stoneham .....	4,717	1,572
Club total .....	17,052	5,686
Club average .....		1,421

(Continued from page 84)

used throughout, and the engines are built in a special department by the highest skilled workmen, so that a very high grade of accuracy in the selection of materials, finish, and workmanship is obtained.

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Bore and Stroke	90 mm. by 150 mm.
Cylinders	Specially selected cast-iron, water cooled.
Crankcase	Specially strong aluminum alloy.
Crank	Selected high tensile steel, seven main bearings, all of large diameter. This shaft is hollowed out for lightness and the oiling system.
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Pistons	These are steel, machined from the solid with provision for two piston rings.
Camshaft	Special hardened steel, the cams being formed from the solid bar.
Lubrication	Forced by gear-driven pump of special design.
Self-Starter	Special air distributor fitted with valves and pipes complete, ready for coupling up to a compressed air bottle.
Ignition	Two high-tension 6-cylinder magnetos.
Carburetors	Four C. Z. 40 mm. type Claudel Hobson.
Direction of rotation of propeller shaft	The direction is clockwise, viewed from the end of the propeller shaft.
Revolutions	Normal revolutions of the engine 2,000 r.p.m., giving a propeller speed of 1,000 r.p.m.
Consumption	The consumption of petrol is about .58 of a pint per h.p. hour, and the consumption of oil about 3/4 gallon per hour.
Weight	The approximate weight complete, less radiator, is 905 lbs.

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inspection and examination. After this they are subjected to tests on a special bed fitted with a propeller which absorbs the h.p. developed by the engine at its normal revolutions.

Statement of the Ownership, Management, Circulation, etc., required by the Act of August 24, 1912, of Aerial Age Weekly, published weekly at New York, N. Y., for October 1, 1915. Editor, G. Douglas Wardrop, 116 West 32nd St., New York; Managing Editor, G. Douglas Wardrop, 116 West 32nd St., New York; Business Manager, G. Douglas Wardrop, 116 West 32nd St., New York; G. A. Cavanagh, Assistant Business Manager, 116 West 32nd St., New York; Publishers Aerial Age Co., Inc.; Owners: Aerial Age Co., Inc.—Henry Woodhouse, 297 Madison Ave., New York; W. D. Moffat, 119 West 31st St., New York; W. I. Seaman, 20 Exchange Place, New York; J. H. Coit, 120 West 32nd St., New York; L. D. Gardner, 120 West 32nd St., New York; G. D. Wardrop, 120 West 32nd St., New York. Known bondholders, mortgagees, and other security holders, holding 1 per cent or more of total amount of bonds, mortgages, or other securities: None.

Sworn to and subscribed before me this 29th day of September, 1915.

G. DOUGLAS WARDROP, Business Manager.

WESLEY W. FEERIN.

(Seal.)

Notary Public, Kings County.

Certificate filed in New York County. No. 87. New York Register

Number No. 7120.

(My commission expires March 30, 1917.)



## Aviators Needed

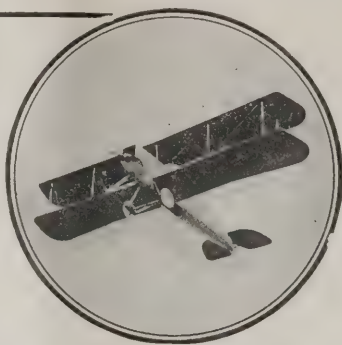
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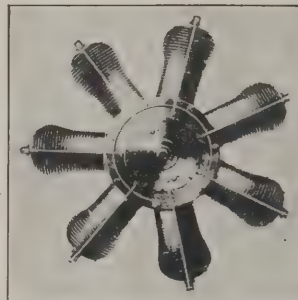


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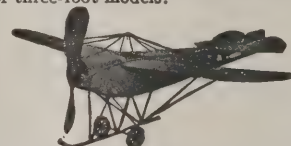
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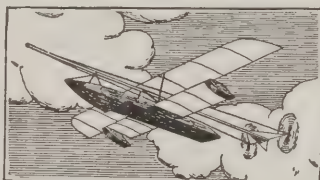
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VOL. II

NEW YORK, October 18, 1915

No. 5

### Miss Nickerson, of Providence, R. I., Gives \$7,500 Check to National Aeroplane Fund

A CHECK for \$7,500 has been received by the Aero Club of America for the National Aeroplane Fund, which was instituted by the club for the purpose of developing aviation corps for the Militia. The donor is Miss Lyra Brown Nickerson, of Providence, R. I., a prominent society woman who is very much interested in the movement to build up our air fleets.

Realizing the need of having a substantial air fleet, and finding that the Army, Navy and Militia together have less than twenty aeroplanes in commission (when this country needs 2,000 aeroplanes and would be unprepared if it had 200), Miss Nickerson, while in New York a few days ago, decided to contribute, through the National Aeroplane Fund, an aeroplane to the Militia.

An official of the Aero Club of America was agreeably surprised two days ago, when Miss Nickerson telephoned to the Aero Club inquiring the cost of an aeroplane. On being told that the average aeroplane cost \$7,500, Miss Nickerson replied:

"I feel that our essential need at present is aeroplanes, and I shall be too glad to contribute one aeroplane to help in the good work the Aero Club of America is doing to supply the Militia with machines and train officers of the Militia to fly. As the Militia is the backbone of our defenses, it ought to have aeroplanes."

By return mail came the check for \$7,500.

This generous contribution will enable the Aero Club of America to furnish the Naval Militia or National Guard of still another state with an aeroplane.

The National Guard of New York was recently presented with an aeroplane and courses of training for two officers of the Guard and two mechanics, by a patriotic lady whose name, at her request, is withheld from publication and who gave a check for \$10,000; a flying boat, and courses of training for one officer and a mechanic of the New York Naval Militia was presented to the above organization by the Curtiss Aeroplane Co., of Buffalo; another flying boat was presented to the Naval Militia of Wisconsin by a prominent sportsman, Mr. B. R. J. Hassell, of Milwaukee; five aeroplanes were presented to the National Guards of California (three), Arizona (one) and Texas (one), those states bordering on the Mexican line, for training officers of the Militia; and \$5,000 was contributed recently by a person interested in the movement, but who does not wish his name to be made public.

Thus the Militia of the 48 states which, nine months ago, did not even have aeroplanes to use during the maneuvers, has not only been supplied with aeroplanes

and aviators to enable the Militia to maneuver under conditions closely approximating modern warfare, but is now being supplied with means with which to organize aviation corps through the National Aeroplane Fund, instituted by the Aero Club of America less than a year ago.

\* \* \*

### Militia Officers Can be Trained at Expense of the War Department

SECRETARY of War Garrison has advised the Aero Club of America, 297 Madison Avenue, New York, that Militia officers can be trained in military aeronautics at the United States Army Aviation School at San Diego, Cal., at the expense of the War Department.

This was in reply to a letter written to Secretary Garrison by the Aero Club recently when the club received a contribution of \$10,000 from a prominent woman to start an aviation corps for the National Guard of New York, and \$5,000 from another anonymous donor for training officers of the Militia of New York and Massachusetts in aviation. Uniformity in training of military aviators is a necessary element of efficiency, therefore training of Militia officers under the War Department's supervision is highly desirable. Whereas there is an enormous amount of work to be done in order to develop aviation corps for the forty-eight states, and as the sums collected through the National Aeroplane Fund could be used for the general expenses of developing aviation corps in the Militia, this proposal on the part of Secretary Garrison is of particular importance.

Sixteen states have become interested through the Aero Club's efforts, and are now ready to take up the work of developing aviation corps for the Militia as soon as they can get funds for aeroplanes and for the upkeep of the corps. The states are:

Arizona, California, Illinois, Iowa, Florida, Maine, Missouri, Nebraska, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Texas, Vermont and Wisconsin.

It is doubtful whether any officers of the Militia can be trained at present at the U. S. Army Aviation School at San Diego, the school being already so short of aeroplanes that, instead of having two or three aeroplanes for each officer-pilot, as they have in European countries, a number of U. S. Army officers have, together, only one machine in which to train. Consequently a number of officers, because of lack of equipment, cannot get sufficient practice.

Secretary Garrison's letter to Mr. Alan R. Hawley follows:

Mr. Alan R. Hawley, President Aero Club of America, New York City.—

My dear Mr. Hawley:

I have received your letter of September 7th, in which you



invite my attention to the efforts that are being made by a number of our generous and public-spirited citizens working in co-operation with the Aero Club of America to promote efficiency and uniformity in the organization of the aviation corps of the National Guard.

I am myself deeply impressed with the importance of developing this element of the National Defense and greatly appreciate the generosity and patriotism of those who have expressed a desire to contribute substantial donations in money to aid in this work.

The complete organizational scheme for the Militia as planned by the War Department calls for the formation ultimately of twelve Aero Squadrons, one for each Militia Division, but owing to existing deficiencies in the more fundamental requirements of organization which have seemed to demand prior attention, and to the great cost of aeroplane equipment for which no funds have been specifically provided by Congress, no progress has been made in this branch of militia instruction.

The relation of the Militia to the Regular Army is such that the instruction of the former must conform to that of the latter, and this principle is recognized by Congress in the law that has been enacted providing for the attendance of officers and enlisted men of the Organized Militia at the United States Army Service Schools. Under this law it would be admissible for officers and enlisted men of the Organized Militia to attend and receive instruction at the United States Army Aviation School at San Diego, California. Provision is made for mileage, subsistence and quarters of those who may be authorized by the War Department to attend, but pay from Federal funds during the period of attendance is not authorized.

According to the provisions of the Militia law referred to authority to attend service schools may be granted by the War Department upon the recommendation of the Governor of the state to which the Militia officers and men belong. If, therefore, a recommendation is made in the usual manner, prompt attention to the matter will be given by the War Department, and if the conditions at the School are reported to be such as to warrant the reception of these additional students, and if the candidates are shown to possess the qualifications for admission required of like grades in the Regular Army, I can assure you that favorable action will be taken.

I am, with great esteem,

Very sincerely yours,

(Signed) LINDLEY M. GARRISON,  
Secretary of War.

#### SANTOS-DUMONT HERE FROM MADRID

Santos-Dumont, the Brazilian pioneer in aeronautics, arrived in New York City on October 7, for the purpose of taking preliminary steps in a plan for the development of aeronautics in South America.

The Aero Club of America a year ago invited Santos-Dumont, who was then in Madrid, Spain, to come to America to head a committee of the Aero Club of America, which would take charge of introducing and developing aeronautics in South and Central America, where aerial transportation can solve many difficult problems.

In these countries, more than in any other, it is believed that aeroplanes will be powerful agents of civilization, facilitating communication and travel between places that are now separated by comparatively few miles in a straight line, but which are nevertheless remotely separated, and often isolated, by reason of mountains and other natural barriers. Aeroplanes of all types from small machines to the great craft capable of carrying a ton that have been developed on account of the demands of warfare can well be used in Central and South American countries. In the opinion of Mr. Henry Woodhouse, of the Aero Club of America, the establishment of aerial transportation lines in these states will revolutionize prevailing conditions.

Mr. Santos-Dumont advised that he would come, and last week the Aero Club of America learned that he had just passed through Cuba on his way to New York. Wishing to extend to him a hearty reception the club ascertained what boats had started from Cuba to New York, and searched the sea with wireless messages to find out on just which boat he was and when he would arrive. The wireless was still searching when Mr. Santos-Dumont walked into the club house and said, "Here I am," to the delight of the club officials who gave him an impromptu reception.

A special committee is to be appointed which will take charge of developing the plans for introducing aeronautics into the states mentioned.

The whole subject is so big, so important, so fraught with possibilities for the promotion of better intercourse that its importance not alone to aeronautics, or to the countries

named, but to the United States as well can scarcely be overestimated.

The proposed work is timely. It fits in nicely with the needs of the hour, inasmuch as all of the Americas now, as never before, have felt the necessity of knowing each other better as they work out their problems of national life under the protection of the Monroe Doctrine.

The work of this committee therefore has a broader and a deeper significance than the work of a mere industrial committee since it will place in the hands of our Southern neighbors the means to level barriers that have always stood between many of the states and the rapid development that ensues when quick transportation is possible between friendly nations.

#### The Aero Club's Work

(Editorial in the Boston Post.)

WHILE the appropriations made by the late Congress to provide for an aviation corps in our military and naval departments—\$300,000 for the army and \$1,000,000 for the navy—recognize the place of such service, the importance of this subsidiary arm is not appreciated. Something better than this must be done if our facilities for national defence are to be maintained.

The progress of the war in Europe has demonstrated the desirability of an ample force of air machines to aid and supplement armies and navies. The destruction of non-combatants, the harassment of quiet and unfortified towns and villages—of which there have been too many instances over there—are not acts of civilized war, and we do not need aviators for such service. But there is no question that as adjuncts to land and naval forces they have become indispensable.

The Aero Club of America has undertaken the raising by popular subscription of a fund for the development of this art, purchasing machines and training pilots. In both France and Germany similar movements have brought in several million dollars in support of the undertaking. Here we have at least equal resources, and commercial as well as military advantage can be gained by employment along this line.

#### The Need of Aeroplanes.

(Editorial in New York Herald.)

CONTRASTED with the equipment of European armies and navies our sea and land forces are relatively weaker in aeroplane equipment than in any other branch of national defense.

At the outbreak of war Germany, France and Russia were each equipped with about five hundred aeroplanes and seaplanes. Great Britain, a laggard in the race, possessed about two hundred and fifty. During the first year of war every available source of aeroplane output has been taxed to utmost capacity, and while the number of aeroplanes in the service of the belligerents is a closely guarded secret it may be confidently asserted that in spite of occasional losses the aeroplanes in the war zones and with the sea forces are to be numbered by the thousand.

The command of the air has become a military term almost as familiar as control of the sea and an advantage of the highest military importance.

The campaign of the French aeroplane squadrons in the rear of the German lines already begins to assume the character of the cavalry raids carried out by Sheridan and other cavalry leaders in the civil war.

In contrast with the hundreds of aeroplanes operating on the European battle fronts the five seaplanes of our navy and the twelve aeroplanes of our army make a sorry showing. The nation which justly prides itself upon this wonderful invention has fallen to last place in its development and use.

A large supply of aeroplanes for the army and navy is an urgent and immediate need for the national defense, and the development of a large number of skilled aviators is equally urgent. In view of their supreme military value on both land and sea it seems eminently fitting that the ability to handle these machines should be incorporated as part of the curriculum at both Annapolis and West Point.



# THE NEWS OF THE WEEK

## David H. McCulloch Flies for Curtiss Trophy

David H. McCulloch, of Newport, Pa., leads in the endurance test being held for the Curtiss five thousand dollar trophy, having made ten round flights between Hammondsport and Penn Yan October 10th, a distance of 440 miles. The flight was under the supervision of the Aero Club of America, which had a time keeper stationed at each end of Keuka Lake, over which the flight was made.

To promote interest and demonstrate the possibilities of the flying boat Glenn Curtiss offered a five thousand dollar silver trophy, said to be the largest ever made, to the aviator owing a Curtiss machine who flew the most miles in any ten hour day. The time expires October 30, when the Aero Club will make the award.

Mr. McCulloch, with a standard type Curtiss flying boat, started from Hammondsport at five minutes before nine o'clock in the morning and flew part of the time against a stiff, dangerous northwest wind, landing only long enough to get gasoline and food. His average speed was sixty-one miles an hour. Instead of keeping close to the surface of the lake, which is customary to avoid the dangerous currents of wind near Bluff Point, Mr. McCulloch flew at an average height of 4,000 feet, many times exceeding that.

Mr. McCaulley recently flew 300 miles at Toronto, and Lieutenant J. H. Towers, U. S. N., flew 392 miles, with Annapolis as a terminal.

## Entries for Curtiss Trophy.

There are now nine entries for the Curtiss Marine Trophy as follows:

Raymond V. Morris, 160 h.p. Curtiss flying boat, representing Aero Club of America.

Lawrence B. Sperry, 80 h.p. Curtiss flying boat, representing the Aero Club of America.

David H. McCulloch, 100 h.p. flying boat, representing the Aero Club of America.

Robert Glendinning, 100 h.p. Curtiss flying boat, representing the Aero Club of Pennsylvania.

Theodore C. Macauley, Model F, 160 h.p. Curtiss flying boat, representing the Aero Club of America.

Glenn L. Martin, of Los Angeles, 150 h.p. Martin seaplane, representing the Aero Club of America.

Clarke Thomson, Curtiss flying boat, 100 h.p. motor, representing the Aero Club of Pennsylvania.

E. K. Jacquith, Curtiss flying boat, 100 h.p., representing the Aero Club of America.

W. H. Kendrick, Curtiss flying boat, 100 h.p. motor, representing the Aero Club of America.

## New Curtiss Machines Delivered to Aero Squadron at Fort Sill.

Mr. Raymond V. Morris, chief pilot of the Curtiss Aeroplane Company, has just completed a series of tests with the new

machines delivered to the Aero Squadron at Fort Sill, Oklahoma. He gave a remarkable exhibition of the Standard Curtiss Tractor, its strength and flying qualities. He looped-the-loop, stalled, and demonstrated side-sliding and vertical banking.

## Glenn L. Martin to Start New Plant Near New York

Mr. Glenn L. Martin who has been in New York City for three weeks has left for Los Angeles with Caleb Bragg. Mr. Martin's visit to the east was very profitable, and he was so convinced of the tremendous possibilities for development and the opportunities available in the East that he has decided to start a branch in New York.

Mr. Bragg went with Mr. Martin to get delivery of the aeroplane which he ordered some months ago, but which Mr. Martin was unable to deliver then on account of the tremendous business pressure.

The manufacturing facilities at Los Angeles, have, however, been greatly increased since then, and notwithstanding the fact that he has received substantial orders from different governments, including the United States Army, his facilities are sufficient to enable him to deliver Mr. Bragg's first aeroplane—we say first because Mr. Bragg intends to have at least two, one for land and one for water flying.

## Art Smith Loops at Night in New York

Art Smith, the twenty-one-year-old aviator who turned flipflops at the San Francisco fair, on October 8, refuted for the benefit of blase New Yorkers the ancient axiom that "There's nothing new under the sun." He showed them what was admitted to be the most daring and foolhardy bit of flying that had ever been done on the Atlantic coast.

Starting from the grounds of the Columbia Yacht Club, at Eighty-sixth street and the Hudson River, he mounted to a height of 3,500 feet, then turning the nose of his biplane downward he made sixteen complete loops in the air, volplaned swiftly to the ground and stopped within ten feet of his starting point. A brilliant blaze of magnesium lighted his course through the sky.

Smith is the only aviator who has ever tried to loop at night. His sixteen loops far exceeded his previous record of six.

There was no more interested spectator in the throng than the young flier's wife, Mrs. Aimee Cour Smith, and few were as cool as she.

Others who saw the flight were Alberto Santos-Dumont, the Brazilian flyer; Bob Fowler, a California aviator, who is now teaching Harry Payne Whitney to fly, and Bud Mars, the dirigible navigator.

The machine that Smith used was a Curtiss type biplane of his own construction, fitted with an Aero-Marine six cylinder motor of 75 horse-power.

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57-33

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### The Movement in Maine for an Aerial Station

The Chamber of Commerce of Portland, Me., has enthusiastically taken up the proposition to have established near that city an aerial station, the first in a series along the seacoast for defensive purposes. President George L. Crosman, of the Chamber of Commerce, has appointed a committee, representing the whole state, which will have the matter in charge. This committee is composed of: Hon. William M. Ingraham, Portland; Col. Fred. N. Dow, Portland; Hon. E. B. Winslow, Charles F. Flagg, Col. Frederick Hale, Richard Payson, Frank L. Rawson, Lieut. Reuben K. Dyer, Rear Admiral Robert E. Peary, Eagle Island, South Harpswell; Hon. Edward W. Hyde, Bath; Hon. Arthur Chapin, Bangor; Col. F. E. Boothby, Waterville; William D. Pennell, Lewiston; Hon. Charles H. Prescott, Saco; Prof. George T. Files, Brunswick; George L. Crosman, president of Chamber of Commerce, W. B. Moore, executive secretary, Chamber of Commerce, members ex-officio.

In announcing the appointment of the committee, W. B. Moore, executive secretary, sent this letter to each member:

"Gentlemen:—

"In line with recommendations and efforts of Rear Admiral Robert E. Peary to have an aeronautical station established on or near Portland Harbor, which matter has been referred to this Chamber of Commerce for attention, I have been directed by President Crosman to notify the above gentlemen of their appointment as the committee on this subject.

"This is both a very pertinent and important matter, not only to the citizens of Portland, but to the State of Maine as well; it being conceded that this harbor and Casco Bay offer exceptional opportunity for the establishment of such aeronautical station, and we have been fortunate in having the splendid service of Rear Admiral Peary to direct and aid us in this matter.

"We trust that all of the gentlemen named will accept this duty to serve the City, State and Nation and respond to a call for a meeting on this subject at an early date."

Rear Admiral Peary, who has offered for the establishment of the station the use of Flag Island in Casco Bay, has been notified of the selection of the committee and has been asked to name a date for a meeting of the committee, with Henry A. Wise Wood and John Hays Hammond, Jr., who Admiral Peary has stated would be willing to go to Portland and give the committee all possible aid in the establishment of the first station.

The Chamber of Commerce feels that there is a very excellent chance of getting the Federal Government to establish a station there, and that on account of the strategic importance of the waters a submarine station should follow also as a matter of course. In the wake of these stations there will eventually come shops, supply stations and repair depots which are commercially valuable to the city, and to the state. But the men of Maine are not, however, prompted by commercial motives alone. They foresee the necessity of aerial stations along the coast and are anxious to do all in their power to have the first of the series established on their state, not only for their own benefit, but for the good of the nation.

### Detroit May Give an Aeroplane

Mr. Roy D. Chapin, the automobile builder of Detroit, who is treasurer of the Aero Club of Michigan and who is also a member of the Aero Club of America, came to New York for the Sheepshead Bay races, and visited the club.

He dropped automobiling for a while to talk aeronautics. In fact he said he came to the Aero Club of America to be relieved of the intensive pressure of the automobile business and to find solace in the inspirational subject of aeronautics.

Mr. Chapin states that the Aero Club of Michigan will be pleased to participate in the movement inaugurated by the Aero Club of America to develop an aviation corps for the militia—and the club officials very promptly developed a plan with him, which in the near future may result in Detroit giving an aeroplane to the militia of Michigan.

### Mrs. Harry Payne Whitney Makes a Flight

Mrs. Harry Payne Whitney is one of the few women who can tell her friends about the delights of an aerial trip. Her husband's big Burgess-Dunne model hydro-aeroplane was recently taken from Marblehead, Me., to Port Washington, L. I., and there Mr. Whitney is taking lessons in aerial navigation under the guidance of Clifford L. Webster. The other day Mrs. Whitney stepped into the big machine. It was towed out into the water and presently arose into the sky and circled about like a hawk. At the end of the flight Mrs. Whitney declared that the trip was delightful, and her pilot stated that she apparently enjoyed it.

The hydroaeroplane is at present housed in a big tent, but it will soon be sheltered in a hangar which is being erected on a five-acre plot that Mr. Whitney has leased on Cow Bay, near the Manhasset Bay Yacht Club. A marine railway traverses the plot to the water's edge.

### Lieut. Towers Weds Miss Carstairs

Lieutenant John H. Towers, U. S. N., Naval Attaché at the American Embassy, in London, and Miss Millie Carstairs, daughter of Charles Carstairs of Philadelphia, were married in London on October 5. The ceremony took place in the Savoy Chapel Royal.

### Mr. F. S. Lahm Here from France

Mr. F. S. Lahm, the pioneer balloon fan, arrived in this country last week from France, where he has been residing of late years. He reports tremendous activity in the development of military aeronautics. Some of the information given by Mr. Lahm will be printed in future numbers, if Mr. Lahm permits the same.

### Vincent Astor's First Flight

Vincent Astor, unknown to his friends, slipped away from his estate at Rhinecliff on the Hudson, on October 7, and took his first flight in his new hydroaeroplane. He enjoyed practice spins of several hours up and down the Hudson. The machine worked perfectly, and Mr. Astor expressed himself as well pleased with his initial efforts.



Joe Bocquel and his Christofferson biplane, in which he looped-the-loop at Redding, California.



### Flying Over Sheepshead Bay Speedway

Commencing next spring weekly flights will be a feature of the Sheepshead Bay Speedway. Details of the plans have not yet been worked out, but it is expected that arrangements will be made by which aerial flights may be looked for on each Saturday. Prior to the opening of the track with the big automobile contest last week a few hundred persons who had assembled for elimination trials witnessed a very fine aeronautic exhibition by John Demenjoz, the Swiss aviator.

After circling the track a few times he drove through the wind and rain upward until he suddenly disappeared in the clouds. The purr of the engine was faintly heard for a time and then this, too, was lost. Presently, however, the aviator reappeared shooting straight downward in a daring volplane which ended in front of the grandstand. Then he looped-the-loop forward and backward, drove upside down for a mile and, finally, from a height of 1,000 feet, volplaned straight downward, lightly landing close to the spot from which he has ascended. Demenjoz flew a Bleriot monoplane.

The great attendance at the opening automobile contest on the new speedway indicates that it will be the Mecca of sportsmen, and the scene of great events in the world of speed.

### Military Aviation News

Mr. George E. A. Hallett, instructor in motors at the Signal Corps Aviation School, was married last week in Los Angeles. He is now on a two weeks' honeymoon, and upon his return he will reside at Roseville, California.

Lieutenant Douglas B. Netherwood has returned from leave of absence. Captain Ray W. Bryan, Medical Corps, has been assigned to duty as surgeon at the Signal Corps Aviation School, Lieutenant Ralph Royce, Twenty-sixth Infantry, has reported at the Signal Corps Aviation School for duty as an aviation student. Lieutenants Carl Spatz and Sheldon H. Wheeler, Twenty-fifth Infantry, have been ordered to report at the Signal Corps Aviation School for duty as aviation students.

Lieutenant Earl L. Canady, Thirteenth Cavalry, has been ordered to report to a board of which Captain Fred W. Palmer, Medical Corps, is president, for examination for rating as a junior military aviator.

Lieut. Walter R. Taliaferro, who was considered one of the best aviators in the service, fell 1,800 feet into San Diego Bay on October 11th and was killed. He entered the aviation service in 1913 and this, his first accident, proved fatal.

### Judge Remits \$100 Fine

Judge Avery, in the Quincy, Mass., District Court, remitted a \$100 fine which had been imposed on Harry Jones, aviator of Providence, R. I. Jones was in an accident last June in which two companions were killed. Following the accident he was arrested for flying without a license. The fine was imposed then, with the condition that he refrain from flying until October 1. Having done so the fine was remitted. The case was originally taken into court because the Quincy police desired to make a test case of it.



Demenjoz, the Swiss aviator, demonstrating his looping-the-loop abilities to the officials of the Sheepshead Bay Speedway on a rainy day.

### Orville Wright Sells Aeroplane Rights to Syndicate

As a result of the negotiations which have been pending for the past six weeks, The Wright Company, of Dayton, Ohio, has been sold to a syndicate which includes Messrs, William B. Thompson, Albert H. Wiggin, President of the Chase National Bank, and T. Frank Manville, President of the H. W. Johns-Manville Company.

The purchase of the Wright Company was contemplated a year ago, but nothing definite was done. Three months ago the negotiations were resumed which resulted in the sale.

Orville Wright will be retained as consulting engineer and will have charge of all the construction and development work. A laboratory will be built at Dayton, where he may be assisted by eminent aeronautical experts.

Group of students at the Flying Boat School of the Curtiss Co., Buffalo. From left to right: T. Wong, F. Wong, Harold Pitcare, R. J. Kahl, Electrician First Battalion Naval Militia of New York, Walter Johnson, Theo. Pitcare, Al J. Engle, Instructor, Lee H. Harris, Ensign First Battalion Naval Militia of New York, Frank Maython, Third Battalion Naval Militia of New York, T. Yu, and Al Johnson.





### Santos-Dumont and Peary Make Flights

Rear Admiral Robert E. Peary, discoverer of the North Pole, took his first aeroplane flight recently, and had the additional excitement of having to volplane into Long Beach inlet when the engine stopped 1,200 feet above the earth. Apparently he enjoyed the experience hugely, pleased that the mishap allowed him a privilege that was denied the other members of the flying party.

The arctic explorer made the trip with Frank H. Burnside, a pilot employed by Truman W. Post, who has been making daily flights at Long Beach. The aircraft was a flying boat of the Curtiss type. In Admiral Peary's party were Alberto Santos-Dumont, the Brazilian aviator; Allan R. Hawley, President of the Aero Club; Henry A. Wise Wood, President of the Aeronautical Association and a member of Secretary Daniel's Naval Advisory Board; Mrs. William H. Bliss, whose husband is an aviation enthusiast; Henry Woodhouse, a governor of the Aero Club, and Lansing K. Tevis, of California.

Admiral Peary's flight ended about a mile from the starting point, and, when it was seen that the pilot was unable to start the engine, a motor boat set out from shore and towed the aircraft back. Admiral Peary was smiling when he stepped on land and said that it had been a great experience.

"I thought it was all part of the game when we started to come down," he said. "I hadn't the slightest idea that there was anything wrong with the machinery. There wasn't a moment of the flight that I didn't enjoy."

"How would you like to make a trip to the Pole in an airboat?" one of the party asked.

"That would be fine," he said, then added smilingly: "In the summer time."

The fault which caused the airboat to descend was diagnosed as magneto trouble. The magneto, Mr. Post said, was merely a temporary one, but the engine had never stopped with it before. Mr. W. Wood and Mr. Woodhouse had to miss their flights because of the impossibility of repairing the engine.

Mr. Santos-Dumont, who made the first exhibition flight ever made with an aeroplane, had his first ride in an aeroplane in this country with Mr. Burnside. The Brazilian aviator is here to head a Pan-American Aeronautical Committee which is to take charge of a movement to develop aeronautics in South and Central America. Admiral Peary also is a member of the Pan-American Committee.

But it was not to the lot of either Admiral Peary or Mr. Santos-Dumont that the distinction of making the first flight fell. The honor went to Mrs. William H. Bliss, who is more than sixty years old. She was not at all perturbed when the life equipment was placed over her head, and she laughed in delight when the aircraft started on its journey.

"It was perfectly delightful," she told her friends after the descent. "At first I found it a little hard to breathe going at such a high rate of speed, but that feeling soon passed. I am more than anxious to go up again."

### Four Balloons Started in the Race

Four of the balloons entered in the long distance race from Wichita, Kansas, started away in a southeasterly direction at 5 P. M., on October 7. They passed out of sight in the following order: First, John Watts, piloting Kansas City I; second, H. E. Honeywell with Wichita II; third, Paul J. McCullough with Wichita I; fourth, William F. Assman with St. Louis I. The latter's basket lifted from the ground with a broken girder, but it was thought that this would not interfere with the race.

Two of the contestants have officially reported: Mr. Honeywell landed at 10 A. M. on the following day at a point four miles northeast of Elkins, Ark., with his mechanic P. D. Wood; Mr. McCullough landed at 4:30 A. M. on the following day six miles east of Udall, Kan.

After several futile attempts to overcome difficulties, Warren Rasor, who had entered the race with Dayton I, withdrew and did not start.

### Charles C. Witmer, Curtiss Aviator, Married

Mr. Charles C. Witmer, who is representing the Curtiss Aeroplane Co. in Russia, was married on July 28th, at Sevastopol, to Miss Lydia Michaelovna Pelcig.

### Sturtevant News

The 140 h. p. eight cylinder Sturtevant aeronautical motor which the U. S. Navy Department has specified for installa-

tion in the dirigible balloon, recently constructed for them by the Connecticut Aircraft Co., has been completed. The motor has been thoroughly tested and is now being shipped to the U. S. Navy Aeronautic Station, Pensacola, Fla., there to undergo its official trials in the balloon.

The engine which was designed especially to suit aeronautical requirements is of the four cycle, water cooled, "V" type, having a bore of 4" and a stroke of 5½", operating at a normal speed of 2000 R.P.M. The motor delivers 140 h. p. at 2000 R.P.M., and at 2200 R.P.M., actually develops 147 h. p., these results having been obtained from a water absorption dynamometer to which the motor was connected direct.

The reducing gear which is ordinarily used to obtain the proper speed of the propeller shaft has been dispensed with and a special extended crankshaft provided to which the wheel of a Sturtevant No. 11 Multivane fan is attached direct. This fan is capable of delivering 3000 C.F.S. against 1¼" of water at 8000 R.P.M. and will be used for equalizing the pressure in the balloonettes necessary for the proper operation of the dirigible. In addition the motor will operate twin propellers of the swivelling type.

The official trials will probably take place some time during the latter part of the month, and it is expected that some interesting results will be obtained.

The following cablegram was recently received from England by the B. F. Sturtevant Co., of Hyde Park, Boston, Mass.:

"Aeroplane flights daily. Motor running perfectly. Admiralty advise no further assistance desired. All sailing sixth on Philadelphia.

"Channonhouse."

Mr. Channonhouse was in charge of the testing of the Sturtevant aeronautical motors previous to his departure to England, where he has been stopping during the last two months. The object of his trip was to test out the first lot of Sturtevant aeronautical motors that had been shipped to England.

The motors are of the four-cycle, water-cooled "V" type, rated at 140 h. p. at 2000 and 147 h. p. at 2200 R.P.M. A reducing gear is employed in order to obtain the proper speed at which the propeller shaft should operate. Upon the completion of the tests the engines were then installed in the British war planes and tested out under flying conditions. The officials representing the British Admiralty were so pleased with the results obtained that they expressed nothing but the greatest praise for the Sturtevant "eight."

The above cablegram from Mr. Channonhouse confirms previous communications received from him in which he states that not only were the motors operating to the extreme satisfaction of the Admiralty, but any reports to the contrary were absolutely incorrect.

A twelve hour non-stop run was recently made on one of these motors running under full load and full throttle, the motor being connected to a dynamometer. At 2000 R.P.M., a little over 140 h. p. was recorded and at 2200 R.P.M. 147 h. p. was developed. Examination found the motor to be in perfect condition at the end of the run.

The Sturtevant Company are now in a position to accept large orders and can guarantee excellent deliveries beginning two weeks from receipt of order.

### Pensacola Aeronautic Station News

HAVING successfully completed the flying tests prescribed by the Navy Department for officers preliminary to their being designated as Naval Aviators, Lieutenant (j. g.) E. W. Spencer, Jr., U. S. Navy, has been recommended by the Commandant of the Aeronautic Station for promotion to that status and that he be issued the Navy Air Pilot's Certificate.

Navy Air Pilots' Certificates are issued by the Navy Department to all officers who qualify in accordance with the conditions specified in the Department's Circular of April 10, 1913, the issue of such certificates being duly noted on the records of these officers, and appropriately entered in the Navy Register, with the dates of qualification, against their names.

Preliminary to taking the examination prescribed by the Navy Department the candidate is required to successfully pass a written examination in theory of the mechanics of the aeroplane, and on practical points of aeroplane construction, and on the various types of internal combustion engines used as the propelling medium in aeroplanes. Having successfully passed this examination, the candidate is permitted to take the test for a certificate as a Naval Aviator.

(Continued next page)



# COMPARISON OF THE AIR RESISTANCE OF STATIONARY AND VIBRATING WIRES

By T. E. STANTON, M. Inst. C. E.

SOME experiments have been made to determine the difference (if any) between the resistance of a thin steel wire placed in a uniform current of air (1) when steady and (2) when vibrating with a fairly high frequency.

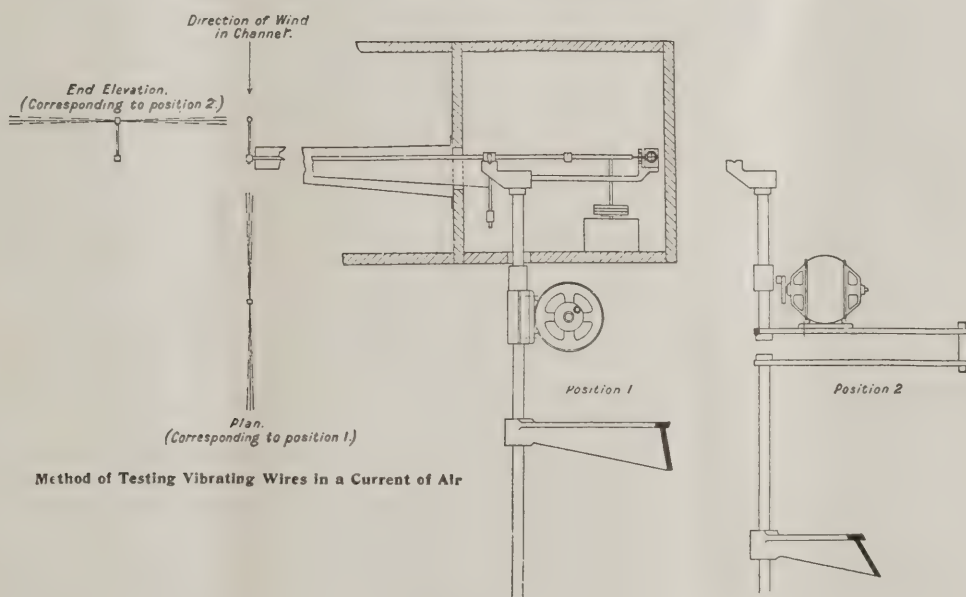
Some difficulty was experienced in devising a suitable method of causing the wire to vibrate, and the method finally adopted was to apply to the weigh-beam which carried the wire under test a forced vibration, whose period could be made to coincide with the natural period of vibration of the wire under test, but the amplitude of which would be so small as not to interfere with the estimation of the forces on the wire itself. To test this method the column carrying the knife-edges of the weigh-beam in the vertical channel, which is supported by a bracket bolted to one of the steel stanchions supporting the roof, was lowered through a distance of 2 ft. 6 ins., and an extension piece, consisting of a vertical column and a cranked horizontal arm, fitted to the original column. (The arrangement is shown in the Fig.) The disturbing force was produced by a small motor carrying an unbalanced pulley, which, when mounted on the horizontal arm of the column, would produce oscillations of the wire in a vertical plane, and, when attached to the vertical part, oscillations of the wire in a horizontal plane. The speed of the motor was about 1,300 r.p.m., and by experiment it was found that the period of free vibration of a steel wire 8 ins. long and 0.063 in. diameter clamped at the end was of the same order of magnitude. A test specimen was therefore made by soldering two pieces of the wire into a vertical spindle, screwed into the

end of the arm of the weigh-beam, so as to form a horizontal specimen 16 ins. long. On testing the arrangement it was found that, by attaching a speed regulator to the motor, it was possible so to regulate the period of the disturbing force that oscillations of more than half an inch amplitude at the end were produced in the wire without affecting the sensitivity of the weigh-beam. The results are given in the following table:

EXPERIMENTS ON A STEEL WIRE 16.13 ins. LONG BY .063 IN DIAM.

	Speed of current—ft. per sec.	Resistance of wire in lbs.	Time of oscillation in secs.	Value of $k$ in formula $P = kv^2$
Wire steady.....	15.1	.00190	—	.00118
Wire vibrating in vertical plane.....	15.1	.00193	.043	.00120
Wire steady.....	17.4	.00247	—	.00116
Wire vibrating in horizontal plane.....	17.4	.00247	.043	.00116

It will be seen that practically no difference would be detected between the resistance when the wire was steady and when vibrating in either a horizontal or a vertical plane. The total resistance was, of course, very small, but the sensitivity of the weigh-beam was such that variations of 0.00005 lb. could easily be detected, so that any difference in resistance due to the vibration must have been less than 3 per cent. of the total.



First Lieutenant F. T. Evans, U. S. M. C., of the Class of Student Aviators assembled in July, has qualified and is flying alone in the accomplishment of the forty hours of flying alone, which is compulsory before the student is permitted to take the examination for promotion to Naval Aviator. Of the class assembled in July, four officers are now flying alone. Two of the new school machines have been shipped from the Curtiss factory at Hammondsport, New York, and are due at the Aeronautic Station within a week.

Naval Aviators, Lieutenants E. W. Spencer, U. S. N., and E. O. McDonnell, U. S. N., recent graduates of the Flying School, have been designated as assistants to the Officer in Charge of the Flying School, and have been attached to that officer's staff as instructors in flying. This detail makes three qualified Naval Aviators who are acting as instructors for the student aviators.

The catapult, or aeroplane launching device, was operated on October 4 under actual conditions, when Lieutenant (j. g.) R. C. Saufley, U. S. N., was successfully launched in a Curtiss Flying Boat.

Naval Aviators Lieutenants P. N. L. Bollinger, U. S. N., and W. Capehart, U. S. N., dropped explosive bombs from an altitude of 3,500 feet on October 4 by way of experimental co-operation with the Bureau of Ordnance, under whose cognizance the bombs were manufactured. The Burgess-Dunne Seaplane AH-10, equipped with a gyro motor, was used for this work. Lieutenant Bollinger piloted the machine, while Lieutenant Capehart acted as observer and bomb thrower.

The Commandant has appointed a board consisting of Naval Aviator Lieutenants P. N. L. Bollinger, U. S. N.; R. C. Saufley, U. S. N.; C. K. Bronson, U. S. N., and First Lieut. A. A. Cunningham, U. S. M. C., to thoroughly investigate and conduct tests of commercial products and to report upon a suitable and adequate equipment for aviators in preparation for the coming winter's work in the air. Heretofore makeshift costumes have been permitted during the winter, having regard principally to the warmth afforded therefrom to the aviator. With the probable increase in the radius of action of the new machines, however, which are now under

(Continued on page 114)



# THE RIGID DYNAMICS OF CIRCLING FLIGHT

The Third Wilbur Wright Memorial Lecture Delivered  
before The Aeronautical Society of Great Britain.

By Prof. G. H. Bryan, Sc. D., F. R. S.

(Continued from last week.)

## X.—A TYPICAL TEST CASE.

17. In order to see how far these conditions are practicable, I consider a test case satisfying the following assumptions:—

- $\alpha$  = constant, and therefore  $\mu$  = constant
- $\sin \beta$  proportional to  $z^n$  where  $n$  is positive
- $dS^1$  the element of area proportional to  $dz$

Under the latter condition  $dS^1 \cos \beta / \cos \alpha$  will be the projection of the element on the plane of  $(x, z)$  and the assumption is that the width of this projection is proportional to  $\cos \beta$ , the wing thus narrowing towards the tip. Under these circumstances the limits of  $\beta$  may be 0 and  $90^\circ$  if desired, the wings thus curling up to the vertical position. If  $c_1, \beta_1$  be the limits for  $z$  and  $\beta$  and we neglect  $x \rightarrow x_0$  or  $x^1$ , (28w), (28q), give

$$2h \int \mu dS^1 \cos \beta = \frac{2\mu c_1 \sin \beta_1 S^1}{n+2} \frac{x \sin^2 \beta_1 S^1}{2n+1}$$

$$0 = \frac{2\mu^2 c_1^2 S^1}{3} - \frac{\mu c_1 \sin \beta_1 S^1}{n+2} \quad (31)$$

Substituting, we have

$$x = \frac{2(n+2)c_1}{3} \frac{\tan \alpha}{\sin \beta_1} \quad (32)$$

and remembering that  $\int dS^1 \cos \beta_1$  is the projection of the wing area on the plane of  $xz$ , if we call this  $\Sigma$ , and call the actual area  $S^1$ , we get

$$h = \frac{S^1}{\Sigma} c_1 \sin \beta_1 \times \frac{-(n-1)^2}{3(n+2)(2n+1)} \quad (33)$$

This result shows that  $\beta_1$  must be negative, in other words, that the wings must be bent downwards towards the tips, not upwards, and that the turning point will be in front of and not behind the centre of gravity, thus closely resembling the action of gulls in circling flight.

If  $\beta_1 = \pi/2$  it will also be seen that the wings will be pointed at their tips, and further, that since  $\tan \alpha$  is small, the turning point is then very little in front of the centre of gravity.

If instead of assuming  $dS^1$  proportional to  $dz$  we assume  $dS^1/dz$  to be proportional to any power of  $z$ , say  $z^i$ , we get a very similar result, the fraction corresponding to (33) being

$$\frac{-(n-1)^2}{(3+i)(n+2+i)(2n+1+i)}$$

18. I have made several attempts to ascertain whether the conditions of the previous paragraphs can be satisfied by any system whose wings are bent or curved upwards, and these trials have led to the following.

**XI.—THEOREM.**—A System with Upturned Wings, none of which are in front of or behind the Centre of Gravity and the Angles of Attack of which are everywhere positive cannot possess perfect Inherent Controllability.

Multiply equation (28w) by  $x$  and (28q) by  $z$  and subtract, assuming  $x^1$  or  $x - x_0$  to be zero and we get

$$2hx \int \mu dS^1 \cos \beta = \int (-4\mu^2 z^2 + 4\mu z x \sin \beta - x^2 \sin^2 \beta) dS^1$$

$$= - \int (2\mu z x - x \sin \beta)^2 dS^1 \quad (34)$$

This shows that  $x$  must be negative or the turning point in front of the centre of gravity. But by (28q)

$$x \int \mu z \sin \beta dS^1 = - \int \mu z^2 dS^1 \quad (35)$$

Hence  $x$  cannot be negative unless  $\sin \beta$  or  $\mu$  is somewhere negative, which proves the proposition.

If the wings are of uniform width and  $\mu$  is everywhere constant,  $\sin \beta dS^1$  is proportional to  $-dy$  so that the coefficient of  $(-x)$  is proportional to  $\int y dy$ , that is, to the area in the plane of  $yz$  bounded above by the wing outline and below by the chord joining the wing tips. It is advantageous to make this area large, for which purpose the wings should be most bent down at the tips, or even in extreme case bent upwards near the centre so as to give a great bend down at the tips.

If the wings are not of uniform width it will be similarly seen that  $\int z \sin \beta dS^1$  is proportional to the volume of the solid contained between the wing surface, and the cylindrical surface formed by horizontal chords joining points symmetrically situated on the boundaries of the pair of wings.

A possible way of securing the conditions here proved to be necessary for perfect inherent controllability would be by making  $\beta = 0$ , except near the tips of the wings and there making either  $\beta$  or  $\mu$  negative. This leads to the case of the straight plane with terminal stabilisers which we proceed to discuss in Section XIII.

## XII.—“FOUR-WINGED” OR TANDEM PLANES.

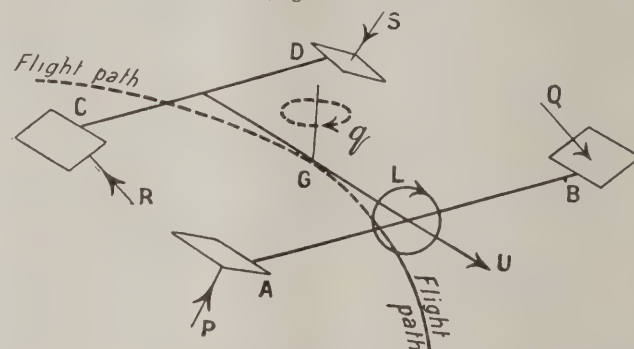
19. There is another entirely different way of obtaining “inherent controllability” in the sense here implied, by making the condition  $M_0 = 0$  independent of the position of the turning point, we leave the two variables  $x_0$  and  $\phi$  at our disposal to satisfy the two other equations of lateral equilibrium. It remains to be shown that systems can be devised possessing this property, although it will be found that a necessary condition is that some of the surfaces should be in front and some behind. Broad wings, having a considerable measurement from front to back, such as are found in many birds as well as insects, are not to be regarded as excluded, except after fuller investigation than what is here contemplated.

The system here chosen for illustrating this possibility is one which I suggested some time ago in the AERONAUTICAL JOURNAL\* in a short note unaccompanied by evidence of a substantial character. It is taken as consisting of two systems of planes or wings arranged one behind the other, one being bent or curved upwards and the other downwards towards the extremities. From (28q) using  $x^1$  to denote distances of planes in front of the centre of gravity, it follows that the necessary conditions for this kind of inherent controllability are given by the equations

$$0 = (\mu z - x^1 \sin \beta) \sin \beta dS^1 \quad (36)$$

$$\text{and } 0 = (\mu z - x^1 \sin \beta) (2\mu z - x^1 \sin \beta) dS^1 \quad (37)$$

taken over the sum total of the wing elements.



Now the first condition is satisfied by any pair of surfaces at equal distances in front of and behind the centre of gravity, one being bent upwards and the other downwards according to the same law. Thus, using suffixes to distinguish them, and supposing  $x_1, x_2$  to be the distances from the centre of gravity taken positive when in front, we have at corresponding points of the two surfaces

$$c_1 = c_2, dS_1^1 = dS_2^1, \mu_1 = \mu_2 \quad (38)$$

$$\beta_1 + \beta_2 = 0, x_1 + x_2 = 0 \quad (39)$$

and from  $dy = dz \tan \beta$  it follows that at all such corresponding points

$$y_1 + y_2 = \text{constant} = y$$

= distance of centre of symmetry of wing area below centre of gravity . . . . . (40)

With these symmetrical relations, (37) requires that

$$0 = (\mu_1 x_1 - x_1 \sin \beta_1) (2\mu_1 x_1 - x_1 \sin \beta_1) dS_1 \quad (37a)$$

this result covering both the rear and front planes.

20. If we try to satisfy these conditions by means of surfaces merely bent up at a single plane dihedral angle in the plane of symmetry ( $\beta$  and  $\mu$  constant) and rectangular in shape, we obtain a quadratic equation for  $x_1$ , of which the roots are imaginary, showing that with rectangular planes and simple plane dihedral angles the problem is impossible.

The right hand side of (37a) is in fact essentially positive in this case. But as the integrand in (37a) is negative where  $x \sin \beta$  lies between  $\mu z$  and  $2\mu z$ , it is clear that the present conditions allow considerable latitude both in the form of the wing surfaces and in the manner in which they are bent or curved.

As particular solutions we have only to assume that either

$$\mu z - x^1 \sin \beta = 0 \text{ or } 2\mu z - x^1 \sin \beta = 0 \quad (41)$$

at every point of the wing surfaces.

21. If we take the latter solution the remaining conditions of lateral equilibrium reduce to

$$2(r_2^2 - r_3^2) h \sin \phi = -ax_0 y \int \mu dS^1 \sin^2 \beta U^2 \quad (42p)$$

$$a \tan \phi = 2h - \frac{x_0 \int \sin^2 \beta dS^1}{\int \mu dS^1 \cos \beta} \frac{U^2}{U_0^2} \quad (42w)$$

which lead to

$$a \tan \phi = 2h \left\{ 1 + \frac{r_2^2 - r_3^2}{ay} \sin \phi \right\} \quad (42u)$$

The equation of equilibrium (28u) gives, however,

$$\int \mu^2 y dS^1 = \int \mu_1 x_1 \cos \beta_1 dS_1 + \mu_2 x_2 \cos \beta_2 dS_2$$

$$= \int \mu \delta \cos \beta dS_1 \quad (42u)$$

taken over one wing with  $\delta$  equal to the difference between the distances of the fore and aft wings from the vertical through the centre of gravity. This means that  $x_1 + x_2$  is not exactly zero, so that the solution here obtained is only approximate. Further, for longitudinal stability it is important that  $\mu_1$  should be  $> \mu_2$ . In any case the present solution does not quite meet all requirements. But since we have seen that the arrangements of the wings can in general be varied within sufficiently wide limits without affecting the conditions of the problem, it certainly appears possible to obtain a slightly different solution not open to these objections.



22. The other solution

$$\mu z - x^1 \sin \beta = 0$$

does not present this difficulty, for if the front and rear planes everywhere satisfy this condition, both (36) and (37) will vanish identically. In this case equations (39) are unnecessary, and no relation need connect the constants of the front and rear planes barring any conditions derived from the longitudinal equilibrium and stability or considered desirable from a longitudinal consideration. With this solution  $x_0 \int dS^1 \sin^2 \beta$  is replaced by  $\int (x_0 - x^1) dS^1 \sin^2 \beta$  in (42u) and  $y x_0 \int \sin^2 \beta dS^1$  by  $\int (x_0 - x^1) \sin \beta (y \sin \beta - z \cos \beta) dS^1$  in (42p).

The geometric interpretations of the various integrals are very simple if the wings are strips of constant width,  $x^1$  is constant and  $\mu$  constant. We have  $\int x^1 \sin^2 \beta dS^1$  proportional to  $\int \mu x \sin \beta dS^1$  or to  $\int x dy$ , the area of the vertical projection of the wing curve bounded by the chord. Under the same circumstances  $\int x^1 y \sin^2 \beta dS^1$  is proportional to  $\int \mu x y dy$ , the product of this area into the distance from the axis of  $y$  of the centroid or the portion on the positive side of the axis of  $y$ , and  $\int x^1 \sin \beta \cos \beta dS^1$  is proportional to  $\int \mu x^2 dz$  or  $\mu c^2/3$ .

23. It will be observed that condition (36) is identical with the condition  $M_x = 0$  (compare p. 154, equations 169) as it should be, for a displacement of the turning point forwards or backwards is equivalent to impressing a corresponding velocity component  $w$  along the axis of  $z$ . Systems satisfying this condition thus possess the further advantage that if suddenly struck by a side gust of wind no couple tending to produce rotation about the axis of  $y$  is set up.

XIII.—STRAIGHT PLANES WITH TERMINAL STABILISERS.

24. The formulæ are somewhat simplified in the case of the system of § 96 in which the main lifting surface  $S$  is straight, but carries at its extremities a pair of "stabilisers" or surfaces each of area  $\frac{1}{2}T^1$ , bent up at a positive or negative angle  $\beta$  and having the angle of attack  $\alpha^1$  whose tangent is  $\mu^1$ . With the further notation and explanations of § 96, we have the following expressions for the forces and couples:—

$$qZ_q = \frac{KU^2}{a} \cos \phi \sin \beta (2\mu^1 z - x \sin \beta) T^1 \quad (43w)$$

$$qL_q = \frac{KU^2}{a} \cos \phi \left\{ -2\mu^1 I^1 - (2\mu^1 z - x \sin \beta) (\cos \beta - y \sin \beta) T^1 \right\} \quad (43p)$$

$$qM_q = \frac{KU^2}{a} \cos \phi \left\{ 2\mu^2 I^1 + (2\mu^1 z - x \sin \beta) (\mu^1 z - x^1 \sin \beta) T^1 \right\} \quad (43g)$$

where  $x, x^1$ , as usual represent the distances of  $T^1$  in front of the turning point and centre of gravity respectively. The equation of moments about the axis  $z$  in rectilinear motion requires that

$$\mu dS^1 + \mu^1 T^1 \cos \beta = 0 \quad (\mu^2 S^1 + \mu^{12} T^1) y = 0 \quad (43n)$$

25. The conditions  $L_q = 0, M_q = 0$ , will be consistent if  $\mu^1 z - x^1 \sin \beta = \mu (z \cos \beta - y \sin \beta) = \mu \zeta \quad (44)$

If  $x^1 = 0$ , this reduces to  $\mu^1 z = \mu \zeta$  and is the condition for neutral or critical equilibrium obtained by Mr. Harper (p. 156, equation (172)) stability requiring that  $\mu \zeta - \mu^1 z$  shall be positive. As Mr. Harper's investigation does not include a rudder plane it is clear that an addition of this kind, if suitably situated, could change the critical into stable equilibrium besides its surface acting as a guide in circling flight. The condition can evidently only be satisfied (if  $x^1$  is small or  $\zeta$  positive) by making  $2\mu^1 z - x \sin \beta$  negative.

The further conditions that the aeroplane may circle freely without canting over require that  $Z_q$  should be positive, and we thus see from (43w) that  $\sin \beta$  must be negative or the wings bent down in order that this may be possible. Further,  $x \sin \beta$  must be positive so that  $x$  is negative and the turning point in front of the centre of gravity, as previously proved generally in Section X. of this paper.

26. The condition that in a four winged or tandem system  $M_q$  shall be independent of  $x_0$ , or as we have seen  $M_w = 0$  becomes, with suffixes for the two sets of stabilisers,

$$T_1^1 (\mu_1 x_1 - x_1 \sin \beta_1) \sin \beta_1 + T_2^1 (\mu_2 x_2 - x_2 \sin \beta_2) \sin \beta_2 = 0 \quad (45)$$

This condition is satisfied by  $T_1^1 = T_2^1, x_1 + x_2 = 0, \beta_1 + \beta_2 = 0$ , as postulated in (38), (39), but it may also be satisfied in other ways as well, as it contains ten variables. Moreover, this condition is independent of the arrangement of the lifting planes. There is, therefore, no difficulty in adjusting the areas, co-ordinates and inclinations of the lifting planes, so as to satisfy the conditions of equilibrium corresponding to (43u) and at the same time make  $\mu_1 > \mu_2$  in order to satisfy the conditions for longitudinal stability. The condition of equilibrium is written down by duplicating the left hand side of (43u) with separate suffixes for front and rear planes.

It may be useful to call attention to the fact that in the remaining condition which we may write

$$\Sigma \left\{ 2\mu^2 I^1 + (2\mu^1 z - x^1 \sin \beta) (\mu^1 z - x^1 \sin \beta) T^1 \right\} = 0$$

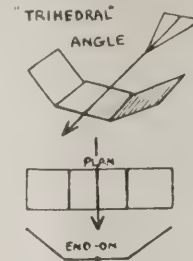
where the  $\Sigma$  refers to the sum of the terms for the front and rear wings, the term containing  $T^1$  has its largest negative value when  $x^1 \sin \beta = \frac{3}{2} \mu^1 z$  and in this case it is only equal to  $\frac{1}{4} (\mu^1)^2 z^2 T^1$  while  $2\mu^2 I^1$  becomes equal to  $\frac{3}{2} \mu^2 z^2 S^1$  if the main planes are rectangular. It will thus be seen that it is difficult by means of stabilisers alone to realise the conditions of inherent controllability of the four-wing system here considered. Of course, this can be done by making  $\mu^1$  considerable, and as  $\mu^{12} T^1$  is equal to  $T \sin^2 \alpha$  it will be seen that this may be just possible when  $\alpha$  is small. At the same time it will be evident, from what has been shown, that it is better to employ curved planes than stabilisers for this particular object.

The fact that certain important terms in our formulæ have been found under certain circumstances to be proportional to the area of the projection of the wing curve on the plane of  $yz$  indicates that a wing sharply bent near the tips may be more efficient than one bent in a continuous curve, and the area in question can be made nearly double as great as if the wings were bent into a plane dihedral angle at their base. Thus, a pair of stabilisers may be considerably more efficient in securing controllability than the conventional dihedral angle.

XIV.—TRIHEDRAL ANGLES.

27. We may use the term "trihedral angle" to denote a lifting surface which is straight or horizontal in the centre and is bent up (or down) at a constant angle  $\beta$  for a finite distance towards its extremities, there being thus one bend on each of the two wings. The bent up parts will thus differ from the "stabilisers" of the last section merely in that they extend for a considerable distance in the direction of the axis of  $z$ .

By using the well known properties of moments of inertia formulæ (43w, p. q) can be extended to these cases with the following modifications:—



(1) Where first powers of  $z$  or  $y$  occur their values are to be taken to be those at the centroid of the area.

(2) Where  $T_z$  occurs in (43g) we must add to  $z^2$  the square of the radius of gyration of the bent up portion about an axis through its centroid parallel to the axis of  $y$ . If this is called  $k_z^2$  it is meant that an extra term  $2(\mu^1)^2 k_z^2 T^1$  must be added to  $2\mu^2 I^1$  in (43g).

(3) In view of the fact that  $y \cos \beta + z \sin \beta$  is constant along the bent up part, the effect in (43p) is represented by inserting an additional term after  $-2\mu^1 I^1$  of  $-2\mu^1 k_z^2 T^1 \sec \beta$ .

(4) There is no change in (43u).

28. It appeared to me to be desirable to ascertain whether it would be possible to substitute trihedral angles for the curved up and down surfaces of the four winging systems of Section XII. and thus obtain the kind of inherent controllability there described. It will be seen that this possibility is conditional on being able to make the integral

$$\int (2\mu z - x^1 \sin \beta) (\mu z - x^1 \sin \beta) dS$$

zero or negative.

Now I find on working out the details (if my algebra is correct) that if the breadth of the surface is everywhere constant and  $\mu$  is also everywhere constant, it is just possible, and only just possible, by suitably choosing the variables and arranging the bend at a particular place, to make the integral equal to zero, and in this case the bends will be at the point of trisection of the total span. (It is easy to make mistakes and get a different result.) This solution is only consistent with the symmetrical relations of (39) which do not, as we have seen, fit in with the conditions of longitudinal equilibrium and stability. Under all other circumstances the integral is positive and it follows that surfaces of uniform breadth bent into a trihedral angle of the kind here described and with the angle of attack everywhere constant cannot be used for the purposes here considered.

If the breadth of the surface be variable this difficulty disappears both for a trihedral or a dihedral angle. For example, having regard to the integrand of equations like (37a) we see that if the breadth of the wing surface increases from  $z = 0$  to  $z = \frac{1}{2} x \sin \beta / \mu$  and decreases coming to the tip at  $z = x \sin \beta / \mu$  we have a shape somewhat resembling a fly's wing, which is readily adaptable to the conditions of the problem. The form must in general be broader towards the tips than near the base.

Texas School of Aviation

The Texas School of Aviation, Inc., has signed a contract with the Fair Association at Portales, N. M., for a series of flights during the fair which will be held the last week in October. Chief Pilot Lester Miller will fill the contract, using a specially built machine of the tractor type with a Kirkham motor.

Built a Target for Aerial Bombs

All attractions at the Woodruff, North Georgia Fair, held at Windsor, were secondary in interest to the aerial exhibition which the management arranged in conjunction with M. Andre Houpert, a French aviator. An improvised fort was built so that the aviator might fly over it, drop bombs and give the good people of the South a lively demonstration of one feature of the European war that they are daily reading about. The announcement of this exhibition created almost unparalleled interest in the territory tributary to Windsor.

Gifts from the Sky

Portland, Me., merchants have just held a very successful "Shopping and Amusement Week," in which Aviator Bud Cary assisted by making flights which brought crowds to the city from many miles in all directions. On each day of the fair he dropped "bombs" in the form of little packages which contained coupons good for various articles of merchandise, ranging from a barrel of flour to a piano. The bombs were filled with flour, and as they struck the buildings and the ground, they broke with a little puff like smoke, thus giving a touch of realism to the display.

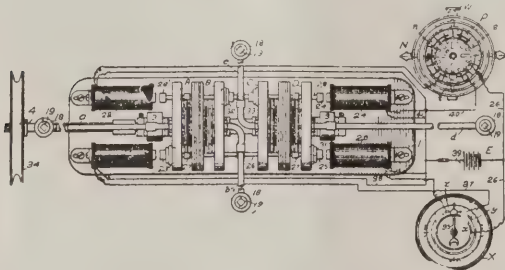


# RECENT AERO PATENTS

BY WILLIAM N. MOORE

1,150,903. AUTOMATIC CONTROLLER FOR FLYING-MACHINES. WILLIAM W. SWAN, Frankfort, S. D. Filed May 11, 1914. Serial No. 837,909 (Cl. 244—29.)

1. In an automatic controller for flying machines, a power driven continuously moving frictional member; a frictional member bearing against said moving member and connected with the stabilizing mechanism in such manner as to move the same, until the reaction balances the friction due to the pressure between the said frictional members; hydrostatic means responsive to tilting of the flying machine, to automatically vary the pressure between said frictional members in unison with and proportional to the said tilting, and without movement of the liquid of said hydrostatic means relative to the flying machine.



1,151,685. AEROPLANE CONTROL. JAMES COWAN HULBERT, St. Louis, Mo., assignor of one-third to William B. Whitney, New York, N. Y. Filed June 21, 1910. Serial No. 568,077. (Cl. 244—29.)

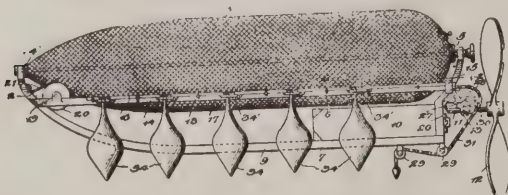
1. In a flying machine, the combination of balancing planes located on opposite sides of the machine, operating shafts therefor, differential gears connecting said shafts, and means for rotating the central of said differential gears while permitting said planes, shafts, and differential gears to rotate freely as a unit about the axis of said shafts.

2. In a flying machine, the combination with the main supporting surfaces of auxiliary moveable balancing surfaces located on the opposite sides of the machine, means operatively connecting said balancing surfaces and including a train of differential gears, and means for rotating one of said differential gears to move said balancing surfaces to varying angular relationship one to the other while permitting said balancing surfaces and said differential gears to move freely as a unit.



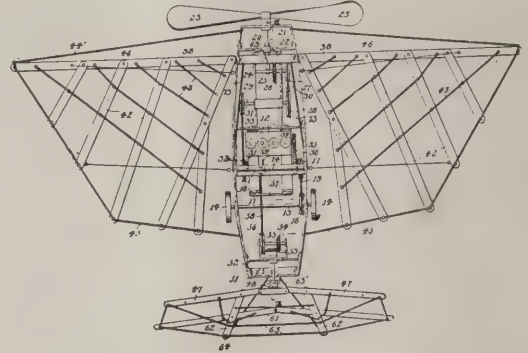
1,152,226. AERIAL TORPEDO. JOSEPH M. SALADINER, Bryan, Tex. Filed April 17, 1915. Serial No. 22,071. (Cl. 244—1.)

1. An aerial torpedo having in combination therewith a bomb-carrier arranged longitudinally thereof, a plurality of bomb-holding receptacles in said carrier each having a downwardly inclined slide, means for releasably holding bombs in position against said inclined slides, and means for automatically releasing said bombs from said receptacles at predetermined intervals.



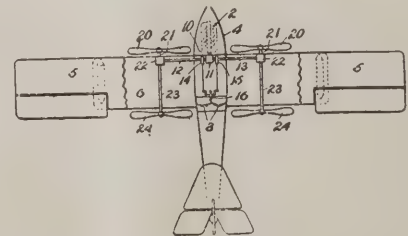
1,133,924. LIFE-SAVING DEVICE. HOWARD C. BRUBACKER, Sault Ste. Marie, Ontario, Canada. Filed Oct. 9, 1914. Serial No. 865,903. (Cl. 244—21.)

1. A life saving device consisting of a garment arranged to closely fit the body of the wearer and a flexible overhanging and relatively wide circular band secured to the body portion at a point adjacent to the upper end thereof and beneath the arms of the wearer and flexible elements.



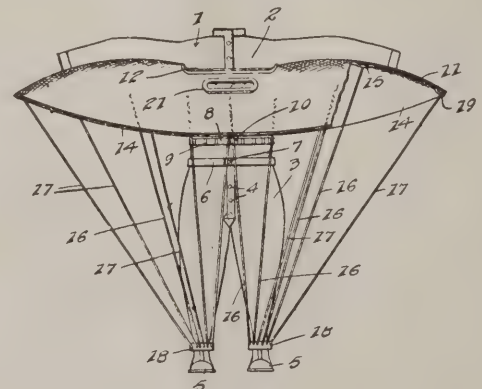
1,143,894. COMBINED AERO, HYDRO AND AUTO PLANE. BRONISLAW DROZINSKI, Scranton, Pa. Filed Feb. 23, 1915. Serial No. 10,010. (Cl. 244—14.)

1. A device of the class described comprising a car frame, a rearwardly positioned transverse brace mounted therein, a steering shaft journaled through the said brace and the rear end of the said frame, a post secured to the rear projecting end of the said shaft, a steering plane hingedly mounted upon the free end of the said post, a flexible connection between the rear portion of the said car frame and said plane, a pulley upon said frame in engagement with the said connection and manual operating means for the said shaft.



1,148,280. EQUALIZING DRIVE MECHANISM FOR AIRSHIPS. HARRY N. ATWOOD and DAVID D. STERNBERGH, Reading, Pa. Filed April 29, 1915. Serial No. 24,652. (Cl. 244—25.)

1. In an air-ship, the combination with a supporting frame and motor, of a pair of front-propeller shafts, a pair of rear-propeller shafts each of which is connected to a front-propeller shaft by a differential gearing, and a common drive shaft for all of said propeller shafts.







# FOREIGN NEWS



## AUSTRIA.

Austrian aeroplanes on October 6th bombarded Kraguyevatz, where Crown Prince Alexander and the Serbian Army Staff have their headquarters. The Crown Prince was uninjured.

## FRANCE.

Berlin claims that France has lost eleven aeroplanes in aerial battles—four shot down and seven landed behind the German lines—during the month of September.

The headquarters of the Kaiser and his General Staff in the western front, recently moved to Luxemburg, the capital of the Grand Duchy of Luxemburg, has been bombarded by French aviators. The Paris report does not speculate on the damage done, but merely states that the station, railroad bridge and military buildings were attacked. Berlin, in its official report, merely says: "Bombs were dropped by French aviators on the neutral city of Luxemburg. Two Luxemburg soldiers, one workman and one shop-girl were wounded." The Kaiser's western headquarters were formerly at Charleville, near Mezieres, closer to the firing line in the Champagne.

The French airship Alsace bombarded the junction Amagne Lucquy and the stations of Attigny and Vouziers. The airship was shelled all along its journey, especially at Vouziers, where it found itself surrounded by numerous clusters of incendiary rockets. The airship has returned safely to its base, after the fulfilment of its mission, having been hit only by a few splinters of shells, which caused no damage.

Lieut.-Aviator Garros, now a prisoner of war in Germany, has given to the French Red Cross a prize of 1,000 francs, which was presented to him by the press of Dunkirk.

Lieut.-Aviator Henri Julien Paul de l'Escaille has received the Distinguished Service Cross from King George for his services in command of the French seaplane squadron in Egypt.

M. René Besnard has been appointed Under-Secretary for War, in charge of Military Aeronautics and Aviation.

Henri Salmet has won the Military Medal for the fine work he has done for the French Air Service.

## GERMANY.

Captain Count Fritz von Koenigsmarck has been killed on the eastern front, and his brother, Count Walter, died Sunday as the result of injuries suffered when landing his aeroplane in a fog. The brothers were amongst Germany's most noted gentlemen riders.

The War Office admits the loss of four aeroplanes during the month of September—two shot down by anti-aircraft guns and two missing.

"During the recent battles in France efforts were made by the British, French and Belgians to land soldiers in civilian garb from aircraft, behind the German front," says the Overseas News Agency. "These men had been ordered to destroy bridges and roads in order to impede the movements of German troops. A number of persons also were sent to Belgium by way of Holland with the same orders. The attempts were frustrated by the vigilance of the authorities."

On October 4th German naval airships damaged two British monitors in the region of La Paune.

## GREAT BRITAIN.

Crossing from Salisbury Plain to join the British forces in France, an aeroplane observer, telling of his first cross Channel flight, describes a battle he and his pilot had with a German Taube en route, which ended in the German being brought to earth.

For a time they were lost in the clouds, when they suddenly heard, though they could not see, the buzz of a biplane on their starboard

below. Just as suddenly as they found themselves enveloped in the cloud bank they burst clear into dazzling sunlight. Then the writer proceeds:

"As we 'cleared' we were astonished to note that we were hardly two hundred feet above another aeroplane, which was following approximately the same course. The huge sloping side planes, the double undercarriage and the ominous crosses showed him to be a German 'Extension-Taube.' We had the 'speed on him,' and gained so rapidly that we were right above him before he noticed us. He then 'dipped outward' and began to climb 'like sin.' On the inside bend of his first bank the German observer opened fire with a Mauser. He was too wide to get even the planes. We circled for his 'blind side' and got our machine gun on him. My pilot stood our machine on the very tip of her left wing and she poised magnificently as I ranged on the German.

When we descended we were much relieved to find some friendly troops near by. They led us to a spot only two fields away where the German had 'crashed.' There lay the Taube, a charred and tangled wreck. There was nothing left of the German airmen but their identity disks clinging to some shapeless bones. We thought of the fortunes of war and how easily the situation might have been reversed."

Nearly a dozen French aviators, all of them picked men, are now in England aiding the British flyers in keeping off Zeppelins.

The British, it is said, used to persist in spiralling upward when first a Zeppelin was sighted. This process required considerable time, during which the fast moving airship was likely to escape. Under the French method the aviator clears the housetops on first sighting a Zeppelin, then he dashes ahead in the same direction as the Zeppelin, gradually rising, and meantime the Zeppelin has not out-distanced the pursuer. Having headed it off and achieving a height greater than the Zeppelin the aviator begins to drop his bombs or fire with his machine gun.

According to a report from the Berlin War Office, four British aeroplanes have been captured during the month of September, and one wrecked.

Field Marshal Sir John French, under date of October 6th, issued an order expressing his appreciation of the valuable work done by all ranks of the Royal Flying Corps in the battle in France, which began in weather that compelled flying at very low altitudes under heavy fire. Gen. French especially thanks the pilots and observers of aircraft for their plucky work in co-operation with the artillery and in photographing and making bomb attacks on the railways, which, he says, were of great value in interrupting German communications.

The Secretary for the Colonies announced, on September 26th, further gifts from the British colonial possessions to the Imperial Aircraft Flotilla comprising eight biplanes.

For his services in destroying a German submarine single handed, Squadron Commander Arthur W. Bigsworth, R.N., has been appointed to the Distinguished Service Order.

## ITALY.

An official communication from General Headquarters of the Italian army on October 9th said: "One of our squadrons, composed of fourteen aeroplanes, yesterday bombarded the office of the Austrian high command at Costanjevica, enemy camps at Oppacchiasolla and the railway station at Nabresina. In spite of a heavy aerial bombardment, our aircraft returned undamaged. An Austrian aeroplane dropped arrows on one of our camps, but no damage was done."

On October 8th Austrian aeroplanes bombarded Rocchetto. No damage was done. In an enemy air attack on the Cervignano station five soldiers were wounded.

A Russian seaplane photographed from one of the giant Sikorsky biplanes.







# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
5730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1363 Townsend Avenue, Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 130, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**HARLEM MODEL AERO CLUB**  
73 West 106th Street, New York City  
**MILWAUKEE MODEL AERO CLUB**  
402 Bradford Avenue, Milwaukee, Wis.  
**CONCORD MODEL CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**AERO CLUB OF ST. LOUIS**  
Columbia Bldg., 8th and Locust Streets, St. Louis, Mo.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### Aero Science Club of America

On Saturday, October 9th, a picked team of six flyers represented the Aero Science Club at the Boy Scout Rally, which was held at the Playground, East Orange, N. J. Those on the Exhibition Team from the club were as follows: Wallace Lauder, Chas. Wm. Meyers, Wm. Hodgins, Jr., Egbert P. Lott, R. C. King, Jr., and G. A. Cavanagh. Mr. John Fleming was on hand with his large kites, but owing to the fact that there was no wind it was impossible to raise the kites. The day was ideal for flying, and many good flights were made to the interest of the five thousand persons present, including the Scouts, all of whom showed interest in the models. Wallace Lauder and Meyers made a few excellent trial flights during the exercises, but a request was made by the Head Scout to cease until the opportune moment as the models drew the attention of both the Scouts and spectators. While waiting for the time to fly four policemen were constantly on guard to keep back the interested spectators who were congregating to see the models. When the time came to fly, Mr. Lauder launched his model, which made three beautiful circles around the small field, then straightened out and flew over the house tops and far beyond the limits of the Playground. Mr. Meyers' model likewise flew outside the grounds, but fortunately curved and made a long graceful glide back into the field. Mr. Hodgins' model looped the loop three times to the amusement of the crowd. The model flown by Mr. Lott circled the field at a great altitude, and finally landed on the roof of a house. The unlucky model was that flown by Mr. Cavanagh, which made two large left circles around the field, then, while flying over the tops of

a row of houses just outside, it suddenly swung to the right and landed among the houses. After an hour's search, the model was given up for lost.

The exhibition was given for the benefit of the Y. M. C. A. of Orange, N. J., and was a success all the way through.

The Y. M. C. A. will hold its contest on November 2d, Election Day, at the Playground, East Orange.

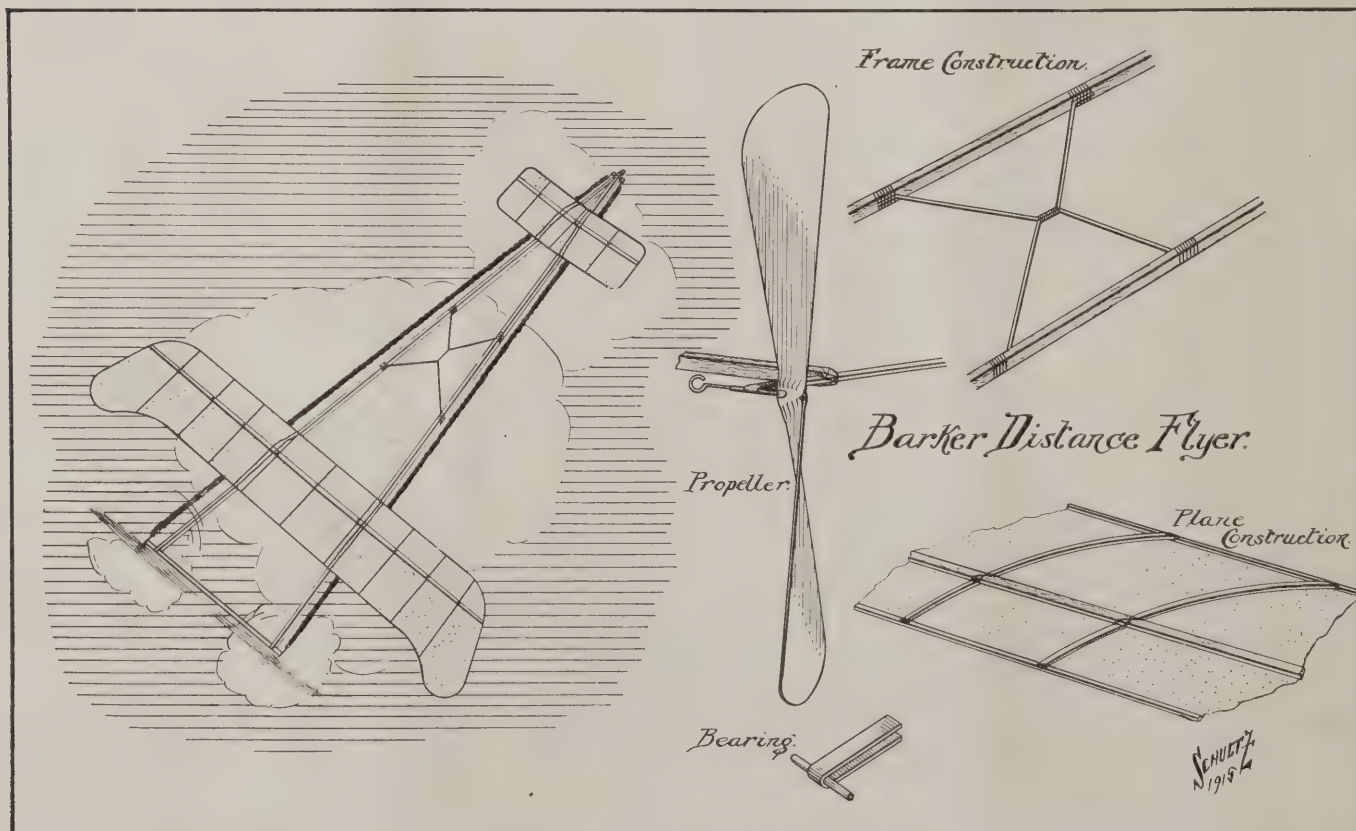
The members of the Aero Science Club are now preparing for the coming R. O. G. contest of the National Competition which will be held on October 24th, Garden City, L. I.

### Barker Distance Flyer

The model shown in the accompanying drawing has proven an excellent straight away distance flyer in gusty winds. Its best flight, thus far recorded, is 1,990 feet, but this was made in a thirty mile an hour wind, and there is very little doubt that, under proper conditions much longer flights could be made. The model is the creation of A. K. Barker, one of the best constructors of the Aero Science Club of America.

The frame or fuselage consists of two side members of spruce, each 42 inches in length and  $\frac{3}{8}$  by  $\frac{1}{4}$  inch in cross section at the center, tapering slightly towards the front and rear. Cross bracing of bamboo is arranged 16 inches from the apex of the frame. The arrangement of bracing is clearly shown in detail in the drawings. A further cross brace, consisting of a single strip of bamboo extending transversely of the frame, is secured to the main frame members by binding and gluing. A propeller brace of split bamboo  $\frac{1}{4}$  inch wide and 13 inches long is secured to the side members of the

(Continued on page 114)







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### She Was a Good Sport

The lady was taking a ride in one of the open-front machines, where there is only a stick as footrest. Her skirts had been tied around her limbs before starting, but were working loose and the air was filling the kinks. The ambidextrous pilot undertook to control the machine with one hand and call her attention to what was happening with the other. He first pointed to the inflated garments, then described a parabolic line with the one free hand. She shook her head, and he thought her face was somewhat flushed and he realized that there were possibilities of his being misunderstood. Then he looked for a suitable landing place and cut off the motor.

"It is ballooning," he remarked as they glided down, alluding to the inflating garments. "Would make good parachuting," she acknowledged quickly.

"Good sport!" he exclaimed, and turning on the motor he straightened up and made for a pink cloud that was lazily floating in the azure expanse. A woman who could contemplate the possible use of her skirts as parachutes in case of a fall deserved an extra long ride, and he gave it to her.

#### The Sidewalks of New York

(Revised)

If you and your lady friend  
Go out of an afternoon;  
Invest in an aeroplane  
Or charter a safe balloon.  
For though, as, of course, you know,  
It's cheaper, a lot, to walk,  
You're taking awful chances on  
The sidewalks of New Yawk.

East side, west side, all around the town  
Planks and beams are going up and streets are going down.

Watch your step, old fellow, watch it like a hawk;  
The Russian army's safer than the sidewalks of New Yawk.

You saunter along Broadway  
In your costliest raiment dressed—  
And bang! You are into a ditch  
With a trolley car on your chest.  
You stop on the avenue  
With a friend for a quiet talk—  
And down you go twenty feet below  
With the sidewalks of New Yawk.

East side, west side, all around the town  
Dust and dirt and gas go up while pavements rattle down.

Watch your step, old fellow, watch it like a hawk;  
I'd rather walk the trenches than the sidewalks of New Yawk.

By James J. Montague in N. Y. American.

How long did it take you to learn to run an aeroplane?  
Three or four.  
Three weeks?  
No. Aeroplanes.

#### A "Sell" for the Zeppeliners

There is a good slice of reasoned philosophy in the following explanation given by a woman to the magistrate of the West London Police Court. "I gave myself up," she said, "because I thought I should be safe in the cells if any Zeppelins came. I was not really drunk."

"Uncle, if the end of the world was to come, and it was destroyed while you were up flying, where would you land when you came down?"

#### Limelight

Have you heard the story of the leading actor-manager who was watching the searchlights playing on the Zeppelins which flew around London the other night? The beams seemed to him to be ill directed, and he was observed to grow more and more uneasy as they increased in volume and intensity. Suddenly, looking up at the light which was projecting its effulgence, afar, he exclaimed: "No! no! All wrong!" Then banging himself in the chest (to indicate the correct spot), he shouted: "Here! HERE!"



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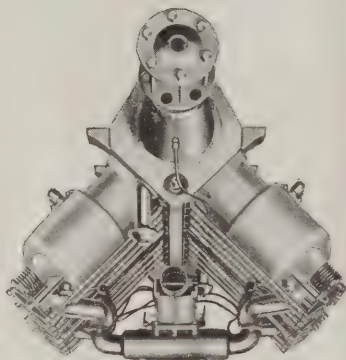
(Courtesy N. Y. Herald.)



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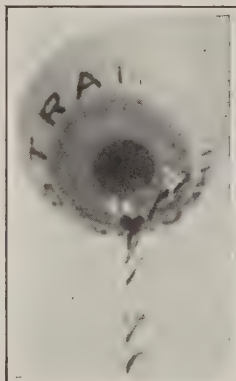
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(Continued from page 107)

construction for the Navy, as regards altitude and distance, their pilots and observers will suffer severely from exposure unless supplied with the proper equipment. Practical experience has taught foreign aviators that personal comfort is essential to efficient control of an aeroplane during cold weather, and that this can only be obtained by the use of specially designed garments, such as will prevent the entrance of a cold penetrating wind or rain, and at the same time allow the aviator free and unrestricted use of all his limbs. The use of proper protective goggles has also been found to be of the most vital importance by foreign countries in the preservation of their air pilots, as loss of eyesight has been found to result from the neglect of this essential precautionary measure. The board has been appointed, therefore, with the view to standardizing this necessary equipment and of making the articles worn conform to a standard pattern and design.

In addition to those men already detailed, twenty-six of the enlisted personnel attached to the Aeronautic Station have this week received "flight orders," which entitle them to an increase of 50% of their regular pay. The enlisted men at the Aeronautic Station receive no special rating, such as "aeroplane mechanic," in lieu of which those men who are actually engaged in aeroplane work during the execution of which they make flights in the aeroplanes, to which they are assigned, receive these "flight orders" together with the attendant increase in pay. In the future, when aeroplanes are sent to the Fleet, an enlisted crew of trained mechanics will be detailed to accompany each machine.

Training of the official personnel for the new dirigible has been undertaken with the assignment of Lieutenant Commander F. R. McCrary, U. S. N., and Navy Air Pilot Lieutenant L. H. Maxfield, U. S. N., to the works of the Goodyear Tire & Rubber Company, at Akron, Ohio, where they are receiving instruction in the manufacture of the envelope and at the same time are making flights in free balloons, which is excellent practice for future commanders of the dirigible type of balloon. Lieutenant Commander McCrary and Lieutenant Maxfield recently made a successful free balloon flight from Indianapolis, Ind., to Akron, Ohio. These two officers will be assigned to duty with the new dirigible upon its acceptance by the government.

Student aviators of the class assembled in July were examined mentally on Friday upon the theory and the mechanics of the aeroplane as well as upon practical points of aeroplane and motor construction, which they had absorbed from their work in the station shops. This examination is in the nature of a preliminary step toward determining their mental fitness to continue in the Aeronautic Service, and is a part of the required examination preliminary to the issuance of a Naval Aviator's Certificate.

(Continued from page 112)

frame, the ends of these members being slotted for this purpose, the brace being placed therein and securely bound and glued.

The propellers are 12 inches in diameter, the blade at the widest part being 1½ inches, the pitch being approximately 22 inches. The propellers are mounted in bearings secured to the ends of the propeller brace, each bearing consisting of a ¼ inch wide strip of brass looped over a ½ inch strip of brass tubing and soldered. A small strip of tubing having a strip of thin flat brass soldered to one of its ends is mounted on the propeller shaft and the brass strip is bent around the propeller hub, as shown. The propeller shafts are of piano wire, of a size enabling the same to fit the tubing and move freely therein without undue looseness. Each propeller is driven by 12 strands of ⅛ inch flat rubber.

The main plane measures 33 inches in span with a chord of 6 inches. The tips are slightly negative. The elevator has a span of 10 inches with a chord of 4 inches and a slight dihedral angle. The main beam in each plane is of brass ¼ by ⅛ inch, tapering towards the ends. As shown in the drawings, the main beams are secured on top of the ribs. The ribs and entering and trailing edges of the planes are of bamboo. The covering is of rice paper and is placed on the under side of the ribs. A preparation is used to tighten the covering.

**Illinois Model Aero Club**  
BY WARD PEASE

Since the outdoor flying season of 1915 is almost at an end, the Illinois Model Aero Club has started planning for the coming winter. The scientific committee has reorganized, and a meeting was held October 8, to plan the winter activities for the development of more scientific models next summer with their correspondingly better results.

C. R. Borkland, chairman of the membership committee, has started the activities of his committee by arranging with Mr. Shoop, assistant superintendent of schools in Chicago,



for meets to be held in the different high schools of Chicago for the purpose of interesting the students in the science of model aeronautics.

There will be indoor meets the same as last winter to be held in the banquet hall of the Auditorium Hotel and, if possible, the Club will try to get the use of some hall or armory for holding demonstration meets. The models used in these meets are limited in design so that they resemble large aeroplanes.

#### Concord Model Aero Club

By EDWARD P. WARNER

All the members of the Concord Club are busy constructing machines for the next national contest for R. O. G. models, and are spending very little time in flying. Some good hand-launched flying was done on Sunday, however, by Borland, Blake, Smith, and Carl. Smith's machine flew at over 30 m.p.h., but was rather unstable. Waid Carl attempted hydro flights, but was unsuccessful, due to a leaky pontoon. Best duration of the afternoon, 30 seconds, by Carl.

#### Pacific Northwest Model Aero Club

In a storm of wind and rain the Pacific Northwest Model Aero Club held their final contest for hydro models on Green Lake, September 30th. Although the average duration of the Club is low, under the unfavorable weather conditions, it is remarkable that even this was made. All the models entered were wrecked at some time during the contest, and the repairs that were hurriedly made were not of a very substantial nature. After every official flight repairs were needed and this required many trial flights which prolonged the contest till nearly dark.

George Stoneham, the club's best hydro flyer, was unable to be present, and Rene Valadon acted as substitute.

After completing his official trials, Robt. La Tour made an attempt to establish a record for flying boats. The best time caught by the judges was 43 seconds. Several flights of 40 seconds were made previous to this. Mr. C. J. Kearny, of the Park Board, Mrs. H. P. Hanson, and Prof. C. A. Guerard, of the Aero Club of France, acted as judges.

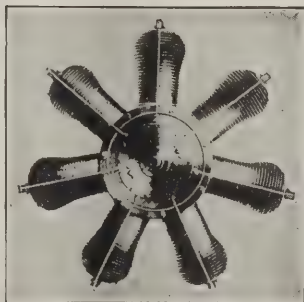
	Best Flight	Total	Average
Rene Valadon .....	40	38	17
Lawrence Garrick ...	40	30	20
Frank Barney .....	27	20	12
Robert La Tour.....	45	43.5	17
			105.5
			35.16
Total .....			116.36
Club Average .....			29.09

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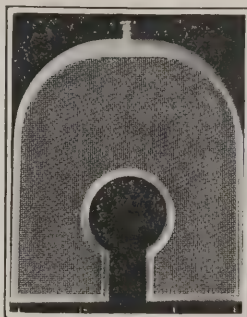
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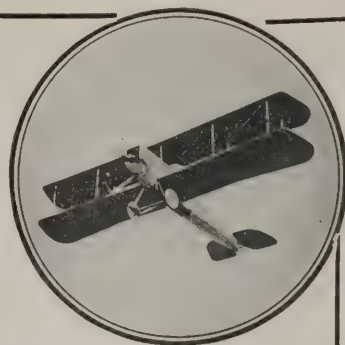
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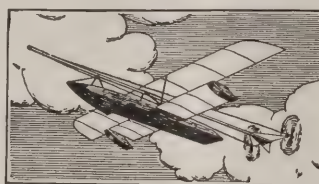
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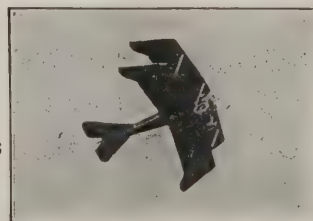
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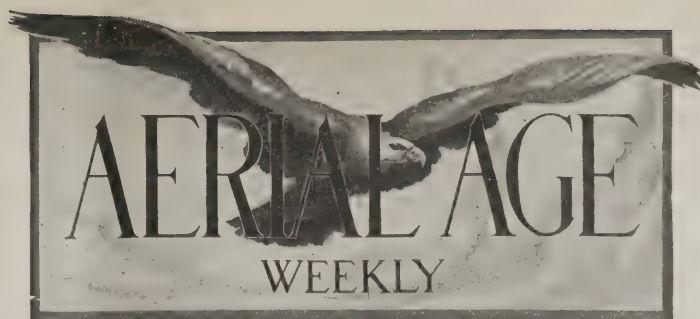
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VOL. II

NEW YORK, October 25, 1915

No. 6

## Organizing Aero Corps for N. Y. National Guard

AT the request of Major General John F. O'Ryan the head of the National Guard of New York, the Aero Club of America has appointed a special Committee to co-operate in organizing an aviation section of the National Guard. This Committee is composed of Messrs. Alan R. Hawley, President of the Club, W. Redmond Cross and Henry Woodhouse, Governors, and R. C. Bolling, a member of the Club, who was Captain of the Motor Machine Gun Troop at the first Plattsburg Camp, and who has just completed his course of training as an aeroplane pilot.

General O'Ryan's letter to Mr. Hawley is of special interest, as it gives an inside view of the many details to be considered in taking the first steps to organize an aviation corps in connection with the National Guard.

None of the 48 states have funds with which to meet the cost of organizing aviation corps, therefore public subscriptions are required. To meet this need, the Aero Club of America instituted the National Aeroplane Fund, to which \$31,000 in cash and seven aeroplanes have been contributed. These funds and aeroplanes have been and are being distributed among a number of states, including New York, Massachusetts, Wisconsin, California, Texas and Arizona.

Through the National Aeroplane Fund the National Guard of New York has received \$11,250 in cash with which to purchase an aeroplane, train five officers and two mechanics and pay for the general upkeep of the aeroplane for a period of time.

General O'Ryan's letter to Mr. Hawley follows:

My Dear Mr. Hawley:

I have received authority from the Governor to organize an Aviation Detachment, and to accept such benefits on behalf of the military service for aviation purposes as were offered in your communication of August 31.

Recognizing the very valuable and intelligent assistance which may be rendered by the Aero Club of America in the development of military aviation in the National Guard, I write to ask the further co-operation of the Aero Club of America in the development of our plans as hereinafter outlined, and in securing the enlistment of young men suitable for aviation service.

In the practical use of air craft for the work of military reconnaissance, it has been found that military training usually does not obtain the character and details of information which the military commander seeks. The trained military officer on the other hand, without some experience in overcoming the novelty of aerial flight, and of acquiring familiarity with conditions affecting observation from the air, is similarly handicapped in making reports. Training and practice in both aviation and military art are therefore believed to be essential for the personnel of an aviation unit in similar manner as they are essential in organization of existing arms of the service.

It is believed that military aviation has made such advances during the past year, and the efficiency of air craft for war purposes has been so amply demonstrated, that their use in future military operations will be necessarily conducted on a

much broader and wider scale than many officers anticipated but a short while ago. Therefore it is probable that in the future organization of aviation units provision will be made for the service of such units with field artillery regiments to aid in the observation of fire, to the Division Commander for purposes of reconnaissance and to independent cavalry organizations for purposes of auxiliary reconnaissance and co-operation in the conduct of raids. The details of the military organization of aviation units have not been determined upon, but it is not necessary that the initial work of organizing an aviation unit and of training the personnel thereof should be delayed pending decision of ultimate organization. There is very much to do before questions affecting this will embarrass the work of the command.

As a matter of convenience and not because of any belief that aviation should not constitute the work of a distinct arm of the service, I have referred the matter of organizing a detachment to the Chief Signal Officer of the Division. In a general way, I believe that the work can best be initiated after conference with a Committee of two or three gentlemen representing the Aero Club of America, and one or two officers of the Division, including the Chief Signal Officer. I would like very much to meet such a Committee at some time convenient to your representatives, and for that purpose request your co-operation in the manner indicated. I believe the following outline might be used as a basis for discussion by the Committee:

- (a) The determination of means best adapted to obtain publicity with a view of securing additional financial aid from public spirited citizens.
- (b) The formation of a list of men adapted for service, who will enter the military service for aviation purposes.
- (c) Assignment of quarters for the aviation unit.
- (d) Decision as to type of machines to be purchased with available funds.
- (e) Uniforming and equipment of personnel of the detachment.

Sincerely yours,  
(Signed) JOHN F. O'RYAN,  
Major General.

To meet the general expenses connected with the further development of the corps the Aero Club of America invites the co-operation and support of those interested in the subject. Checks should be made payable to the National Aeroplane Fund, 297 Madison Avenue, New York City. Those wishing to become connected with the corps are invited to write direct to Major William L. Hallahan, Chief Signal Officer, New York National Guard, Municipal Bldg., New York City.

## Miss Nickerson's Aeroplane for Rhode Island

THE aeroplane for which Miss Lyra Brown Nickerson recently sent to the National Aeroplane Fund a \$7,500 check, will go to the Militia of the State of Rhode Island, where Miss Nickerson makes her home. The gift has been transmitted to Governor R. Livingston Beeckman, of Rhode Island, who has been advised by Mr. Alan R. Hawley, President of the Aero Club of America, that the Executive Board having charge of the National Aeroplane Fund has decided to allow an additional \$500 from the National Aeroplane Fund to go toward a special fund of \$2,500 for meeting the general expenses of starting an aviation corps; for the upkeep of the machine and a hangar. Whether the aeroplane shall be given to the



National Guard or the Naval Militia of Rhode Island will be left to the decision of Governor Beeckman, who is anxious to see both branches of the Militia properly equipped.

In transmitting the offer, Mr. Hawley advised Governor Beeckman that Secretary of War Garrison decided recently that officers of the National Guard can be trained at the United States Army Aviation School at San Diego, California, at the expense of the Federal Government, and urged the Rhode Island authorities to seek the advice of the War Department regarding the general details of the organization of the aviation corps, in case the aeroplane should be given to the National Guard.

If all aviation corps are organized uniformly, with the advice and under the auspices of the War Department, in order that the aviation corps organized by the Militia may be combined with those of the Regular Army in time of need, to make one mighty air fleet, the officials of the Aero Club of America feel that the value of the movement to develop aviation corps in the Militia will be immensely increased thereby. For the same reason, therefore, they suggest that it might be wise to invite the advice of the authorities of the War Department regarding the type of aeroplane to be acquired.

That the movement instituted by the Aero Club a few months ago is attracting the attention of leading men and women throughout the country is attested by the numerous subscriptions coming from different states. Mr. Thomas A. Edison, Chairman of the Naval Advisory Board of Inventions, is among the latest subscribers to the Fund, to which \$40,762 in cash and seven aeroplanes have been contributed. Other recent contributions are:

Miss Lyra Brown Nickerson, \$7,500; Chester W. Chapin, \$500; Philip V. R. Van Wyck, \$500; J. R. de Lamar, \$100; E. A. Sumner, \$100; J. G. Buttle, \$100; G. W. Wilder, \$100; Irene du Pont, \$100; Henry R. Towne, \$50; John C. Ames, \$50; Cornelius N. Bliss, Jr., \$50; Thomas A. Edison, \$50; Lewis L. Clarke, \$50; Robert C. Maxwell, \$30; Charles A. Jackman, \$25; Richard M. Bradley, \$25; Henry J. Biddle, \$25; H. E. Raymond, \$25; Richard H. Hunt, \$25; Charles Robinson Smith, \$25; Capt. John J. Phelps, \$25; W. Hinckle Smith, \$25; R. R. Rhodes, \$25; J. H. Wade, Jr., \$25; Theodore Wilson, \$15; C. E. Young, \$10; William T. Callaway, \$10; Charles T. Dougherty, \$10; "Cash," \$10; E. W. Marland, \$10; Allan Marquard, \$10; Edwin B. Sonner, \$10; Charles Manierre, \$10; Orme Wilson, Jr., \$10; John S. Owen, \$10; Byron S. Adams, \$10; A. C. Kaufman, \$10; Miss Belle B. Gurnee, \$10; Ignatius K. Werwinski, \$10; Edwin T. Curry, \$10; Henry H. Chamberlin, \$10; Edwin C. Mayo, \$10; Thomas H. Barber, \$10; Charles D. Orth, \$10; Robert E. M. Bain, \$10; Alan H. Means, \$10; Millard D. Brown, \$5; F. P. Howe, \$5; "Cash," \$5; George Roberts, \$5; Dr. Chas. D. Lockwood, \$5; W. F. Thornton, \$5; S. A. Tennebaum, \$5; Ludlow S. Bull, \$5; Fred W. Macdonald, \$5.

### Only Four Aero Squadrons for U. S. Army When the Need is for Ten

THE fact that the proposed plans to improve our land defenses provides for only four aviation squadrons, and that if no substantial provision is made to give aviation corps to the Militia of the different states, we would still be aerially unprepared by 1917, is alarming to those interested in the development of the air service, and the Aero Club of America has been flooded regarding the prospects of getting sufficient appropriations for aeronautics. This has caused the Aero Club of America to write to Secretary of War Garrison, asking for further details regarding the prospects.

Mr. Alan R. Hawley, President of the Club, has written to Secretary Garrison as follows

The Honorable Lindley M. Garrison,  
Secretary of War,  
Washington, D. C.

My Dear Mr. Secretary:

The publication of the plans for the increase of the Army and the Militia has brought a flood of inquiries regarding the prospects of getting sufficient aeroplanes for the Army and the National Guard, and whereas the plans as published provide for only four squadrons of aeroplanes, I should very much appreciate further information.

Provision for only four squadrons, considered with the fact that funds for further developments could only be obtained in the year 1917, means that until then there cannot be more than forty aeroplanes available for the Army.

In the light of the recent developments which have conclusively demonstrated the need of aeroplanes in connection with the different branches of the service, the provision for only four squadrons is utterly inadequate—unless the provision for aeroplanes for the Militia is sufficient to offset the deficiency in the Army.

In these days when nations provide their armies with thousands of aeroplanes; when the example of Russia's losses, because of the lack of sufficient air service; and inability of the English air service (which numbers thousands of aeroplanes) to protect London against hostile aircraft, show the tremendous importance of an adequate air fleet, the people of this country cannot help feeling alarmed at the possibility of there being insufficient provision for our air service. That we may intelligently reply to those who inquire the Army's plan to meet the aeronautical needs of the Army and the Militia, will you kindly advise, if consistent with the policy of the War Department, what the complete plans are, putting them in such terms as will enable the layman to understand, and to know just how many aeroplanes we may expect to have in the Army and the Militia by June 30, 1917, when the next appropriation (next to the one now being estimated) will become available.

Those interested in the development of military aeronautics have noticed with considerable concern that the last Congress did not realize that aeroplanes should be considered as "consummables," requiring continuous overhauling and replacing, therefore necessitating an elastic and substantial budget to provide for the upkeep of the aviation corps. Instead of considering aeroplanes as "consummables," Congress considered them as "fixtures," and failed to provide the necessary means for the general expenses connected with the upkeep, and for replacing aeroplanes which wore out or had to be put out of commission on account of breakages and other reasons. As a result we have less than 10 aeroplanes in commission in the Army.

You will realize, of course, that there is no criticism whatever intended in this letter. To the contrary, your efforts to develop aeronautics in connection with the general plan to better our national defenses are heartily appreciated by all.

Very sincerely yours,

(Signed) ALAN R. HAWLEY,  
President, Aero Club of America.

### Making Haste Slowly

(Editorial in Boston Advertiser.)

THE Aero Club of America has realized the need of a more formidable fleet of aircraft and is constantly emphasizing the fact. It has been in receipt of some handsome money contributions to aid in getting airships for the use of the national guard. That the airship is a necessity in modern warfare has been proved by the present European conflict. Both England and Russia, having respectively 1,500 and 1,000 airships, are realizing that even these seemingly large numbers are not enough and that they have been handicapped because of their need of a bigger airfleet. The United States has now at her command but twenty military aeroplanes and aviators. The Naval Department, after much discussion and agitation, has decided to plan for 200 aeroplanes and to order twenty hydroplanes immediately. At this rate it would require at least ten years to acquire the proposed equipment. Anyway, Secretary Daniels cannot be considered at all overhasty, or recklessly precipitate. To order twenty hydroplanes when 100 are needed is rather typical of the present naval administration.



# THE NEWS OF THE WEEK

## Altitude Record Homologated

At the meeting of the Contest Committee of the Aero Club of America there was homologated a flight for American altitude record, made by Lieut. H. ter Poorten, pilot, and Capt. G. E. Visscher, as passenger, officers of the Netherlands Indian Army, at Los Angeles on August 31, 1915, has been homologated as follows:

*American Altitude Record*

*Hydroaeroplanes*

*Pilot and one passenger*

Lieut. H. ter Poorten, Los Angeles, Cal., Aug. 31, 1915, 8,330 ft.

The machine used was a Martin type "TA" hydroaeroplane, equipped with a Hall-Scott 125 H. P. motor.

## Curtiss Toronto Aviation School To Move to Bermuda

Next week Mr. J. A. D. McCurdy will go to Bermuda to arrange for the transfer of the school there for the winter whenever the weather breaks. The equipment will include ten land machines of the J. N. type. Col. W. H. Merritt has offered \$1,000 toward expenses of students' transportation if four others give like amounts.

## "Military Aeroplanes" Adopted by U. S. Navy

Mr. Grover C. Loening's latest book, "Military Aeroplanes," has been adopted by the Aeronautical Department of the Navy as a text-book. It is also being used extensively in the Massachusetts Institute of Technology as a reference book.

## First Aero Company at Marblehead, Mass.

The Naval Militia of Massachusetts will, it is expected, form an aeronautic division in the near future and a recently-organized company at Marblehead is looked upon as the probable nucleus of this division.

Capt. Daniel M. Goodridge of Boston, commander of the division of the naval brigade to which the Marblehead company will be attached, at an enthusiastic meeting in Marblehead, made the assertion that the Marblehead company will be made the aero division of the brigade.

The inference was gained from Capt. Goodridge's statements that W. Starling Burgess and others in the aeroplane industry would probably co-operate with the State in instructing the Marblehead men.

## Resume of Flights for the Curtiss Marine Flying Trophy for Which Nine Pilots Are Competing

Reports that have come to hand from the appointed representatives of the Contest Committee of the Aero Club of America, witnessing the flights of competitors for the Curtiss Marine Flying Trophy, are as follows:

Robert Glendinning, the details of whose flight appeared in Aerial Age for October 4th, 160 miles.

On October 11th, B. H. Kendrick, who is representing the Aero Club of America, started to fly for the trophy over a course from Atlantic City to Bay Head, New Jersey, a distance of 52 miles between these two points. He accomplished two complete round trips, but on the third, after leaving Bay Head, he was forced to alight on the water owing to motor trouble. The reports estimate the distance covered at 300 miles. Mr. Kendrick states that he will make a further attempt.

On October 10th, David H. McCulloch flew over Lake Keuka, Hammondsport, N. Y., for the trophy. The course measuring 24 miles. The report of Mr. McCulloch's splendid performance shows the time of leaving Hammondsport and return for ten round trips. He started from Hammondsport at 8:55 A. M., on the first trip and finished at 4:37 P. M., on the tenth. Total distance approximately 480 miles; time, 7 hrs., 42 mins.

T. C. Macaulay has made two flights for the Trophy; one on September 23rd, and another on October 17th. In the former, approximately 278 miles were covered in 4 hrs., 11 mins., when the pilot was forced to land owing to magneto trouble. In the second trip, which, at time of going to press is reported by telegram only, the competitor made seven trips to Toronto, Hamilton, and return, the round trip being a distance of about sixty-one miles. In the first five trips he carried two passengers and the approximate mileage is estimated at 427 miles, plus the percentage allowed for the carrying of passengers.

## Official Award in the Kansas Balloon Race

William F. Assman, who piloted the balloon St. Louis I, has been officially declared the winner of the long distance balloon race, started at Wichita, Kan. He covered 363 miles. Second place was awarded to H. E. Honeywell, piloting Wichita II, who made 232 miles; Paul McCullough, Wichita I, third, sixty-seven miles, and John Watts, Kansas City, fourth, nineteen miles.

A View of Garden City, L. I., Taken from the Huntington Tractor by Mr. Perley H. Noyes.





**Mr. Gray Goes to Montreal**

Mr. George A. Gray, the Wright aviator who has had a school at Garden City, L. I., for the past two months, is leaving with Mrs. Gray for Montreal, where he is to take charge of the Montreal Aviation School.

**Art Smith at Richmond**

Art Smith made two flights at the Virginia State Fair held at Richmond—one in the afternoon and the other a night flight.

**Jay Smith's Flight Over the Kentucky Line**

Jay Smith made a noteworthy flight over the Indiana-Kentucky line. He went from Evansville, in the former state, to Paducah, in the latter, 150 miles, in two hours and twenty minutes. There was but one stop, at Galconda, Ind., where he refilled his tanks. Mr. Smith says that he had no trouble whatever during the flight, and that his Roberts motor never missed on the whole journey.

Mr. Smith spent some time in Paducah carrying from five to thirty-two passengers a day, under weather conditions so favorable that there was no interruption of flights for two weeks. From Kentucky Mr. Smith went to Detroit to instruct W. E. Davidson in the latter's machine.

**A New Machine at St. Louis**

Aviator Benoist is building a big double-motored machine in St. Louis, for an army demonstration, and it is expected that it will be ready for a demonstration in the very near future. Jay Smith, who flew for Benvist at Chicago all summer, testing and demonstrating, will make the initial flights with the St. Louis machine.

**New Company To Manufacture Rausenberger Motors**

The Dayton Aero Motors Co., the organization of which has just been completed, will manufacture the 12-cylinder Rausenberger aerial motors. Some slight changes will be made in the motor. The double Zenith carbureters will be used, making the manifolds very short. By this method each three cylinders have a carburetor. The manifolds are water jacketed. The new cylinder design have both intake and exhaust water cooled, the hot water from the exhaust surrounds the intake; this heats the ingoing gas and helps to cool the water. An extra oil pump is to be fitted to the oil system, the second being for the purpose of pumping the oil from overflow sump back to supply tank. Plunger pumps are used in order that the supply tank may be at any convenient place without the use of any pressure. It is expected that the new motor will develop 150 horsepower.

**Flight from Saginaw to Michigan**

From Saginaw, Mich., where the State Fair was in progress, to Flint, Mich., where a home-coming celebration was in progress, was the flight made by Don McGee, an aviator of the former city. McGee on the 33-mile flight carried a bag of mail and among other letters was one from the Mayor of Saginaw to the Mayor of Flint.

**Parachute Drop at Stafford Springs**

Nels Nelson, the aviator, was unable to appear at the Stafford Springs, Conn., fair and the committee arranged instead with Prof. Lawrence Davis, of Boston, for a triple parachute jump.

**A GROUP OF AERONAUTIC WORKERS WHO HAVE MADE GOOD**

An interesting souvenir of the reception tendered Glenn L. Martin, on his return after the Great Lakes Cruise. From left to right standing: G. Edward Barnhart, then in metal working division, now head mechanical division Curtiss's San Diego School; Ben W. Riesland, then book-keeper; I. G. Semeniouk, then in metal working division, now head metal worker at U. S. Aviation School, San Diego; R. J. Daum, then foreman, wood working division, now assistant inspector, building department, Los Angeles City Schools; Hugh Aitkens, then in wood working division, now in wood working division; Chas. H. Day, then designer and superintendent, now superintendent and designer with Aircraft Factory, Boundbrook, N. J.; Warren S. Eaton, then designer, now superintendent and designer with Canadian Aircraft Co., Toronto, Ont.; George B. Harrison, then press correspondent in L. A., now press correspondent in San Francisco; Chas. F. Willard, then in drafting room, now chief inspector, Curtiss Factory, Buffalo, N. Y.; L. G. Stern, then motor work and assembly, now motor work and assembly, Glenn L. Martin Co.; B. J. Williams, then in metal working division, now building machines for Japanese Government; Glenn L. Martin, then owner of factory, now owner of Martin Factory; Frank Garburt, then Los Angeles sportsman, now friend of all aeronautical workers in California.



### A. B. Lambert Proposes Air Mail Line

Albert B. Lambert, of the St. Louis Sportsman, says that plans have been completed for two aerial mail routes to be established by the Post Office Department. Each route is sixty miles in length, one of them being entirely in Missouri and the other including parts of Missouri and Illinois. The Missouri route will cover a section with no railway, while the interstate route will start at Peruque, Mo., cross the Mississippi River to Golden Eagle and Brussels, Ill., thence go westward to Beechville, and back across the river to Peruque.

It is planned to establish similar routes all over the country, and to train the aviators as a nucleus for an army flying corps in case of war, Lambert said. The plan is fathered by Postmaster General Bureson and Congress will be asked to appropriate \$5,000,000 for the development of the scheme.

### Thomas News

The past week has been mainly one of preparation. Two different types of machines have been having the finishing touches given them and will be flown during the coming week.

These are the Navy Seaplane, Type HS, with Sturtevant motor; and the new Military Tractor, Type D2, which is equipped with the new 135 H. P. Thomas Aeromotor. The first of these motors has been run daily during the week, for the purpose of testing, discovering any weak points, and obtaining proper adjustments.

The famous Chicago pilot, Mr. Walter L. Brock, hero of London-Paris, London to Manchester, and many other notable cross-country events in Europe, has joined the Thomas Company and will pilot the new machines in their tests. He has taken the place left by Mr. Frank Burnside, who is now flying at Sheepshead Bay.

### Aviation Field at Okmulgee, Okla.

There is a project on foot to start an aviation school at Okmulgee, Okla. The city government and the Chamber of Commerce working together have decided to establish an aviation field and track so that the aviators who reside in that place may make flights whenever they desire. Fred Roberts has been in Okmulgee for some time with his biplane, which is in excellent condition, but he has been unable to make a flight because there is no suitable place from which to start.

### Canada

The Canadian Aviation Schools Fund, of which the Duke of Connaught is patron, and which Major A. Ross Hume, Royal British Flying Corps, is advising, are going ahead with plans to establish aviation schools at Halifax, Winnipeg and Vancouver, to supply the clamant needs of the British forces. Toward the expenses Col. Merritt has offered Winnipeg and Vancouver \$10,000 each on like amounts being raised locally.



The Instrument Board of the Hall-Scott-Engined Glenn L. Martin Seaplane, Showing the Extensive Equipment of the Modern Efficient Aeroplanes.

### Military Aviation News

Experiments are being carried on at the Signal Corps Aviation School with the "Dep" control, and the pilots are gradually being taught to fly this control.

Among the numerous experiments being carried on at the Signal Corps Aviation School, there is a very unique one wherein a parachute is being tried out as a rail-brake to prevent an aeroplane from turning over on its back. Experiments along this line are not yet completed.

Lieutenant Ralph Royce, Twenty-sixth Infantry, has reported for duty as an aviation student.

Among its other accomplishments, the aeroplane is capable of being used for an entirely different purpose from what it has ever been put to. The Lubin Motion Picture Company was hunting for the best way to illustrate a sand storm in the desert. Their scenery was set up on the flying field at the Aviation School and Signal Corps Aeroplane No. 30 was held fast and the motor run at full speed for a moment or two, thus stirring up a real sand storm over the entire scenery of the motion picture company.

David H. McCulloch in Curtiss Flying Boat in Which He Has Made Two Good Flights for the Curtiss Marine Trophy. At the Extreme right, Hon. F. C. G. Eden.





## PLANS OF NEW WRIGHT ORGANIZATION

As reported in our last issue, the controlling interests in the Wright Company of Dayton have been sold to a syndicate of New York financiers.

The officers of the new company were elected on October 14th, as follows:

President, T. Frank Manville, President and a Director of the H. W. Johns-Manville Company and a Director of the Mechanics' and Metals National and the Merchants' National Banks of this city; Vice-President, C. S. Jennison, an attorney of 14 Wall Street, who arranged the purchase of the Wright Company stock for William B. Thompson, head of the syndicate, and Treasurer, Harvey D. Gibson, Vice-President and a Director of the Liberty National Bank, and interested in many other corporations.

The Directorate includes the officers and Orville Wright and Henry R. Sutphen, a Trustee of the American Savings Bank and a Director of the Elco Company, the Electro-Dynamic Company, the Holland Submarine Torpedo Company, the National Association of Engine and Boat Manufacturers, and Vice-President and a Director of the Electric Boat Company. As an official of this latter company Mr. Sutphen recently sold to the British Government \$22,000,000 worth of forty-knot power boats, which are being delivered and are used to scout for submarines.

It was announced that four or five more directors would be added as soon as the syndicate decided upon the men who would be most-useful in forwarding the success of the enterprise.

"It is our intention to develop aviation in every possible manner," Mr. Jennings said to a representative of AERIAL AGE, "and we feel that it would be a backward step to hinder the small constructors. They are all doing good work, and many of them are very successful in their adaptations of the Wright patents. Furthermore, if it were made impossible for them to use the Wright patents, they would go out of business, and aviation would lose the benefit of their researches and experiments.

"While we have not decided upon the basis on which the use of the patents will be granted to independent constructors, it is safe to say that an eminently fair arrangement will be offered. It is probable that a royalty will be fixed, at which our company will receive a stated sum for every aeroplane built. This, however, will be taken up at a meeting in the near future, possibly at our meeting next week.

"The men behind the new company are men who are accustomed to succeed. They do not go into a thing until they are sure that it can be made successful, and in this case the ground was carefully studied long before the negotiations for the purchase of the Wright Company were started. With their great resources, second to none in this country, they will put the aeroplane on a business basis and will develop its greatest efficiency, combined with absolute safety, so that it will become a plain commercial commodity instead of a freak for exhibition purposes or a destroyer for war use.

"We have taken over the Wright factories and schools and will add more factories as soon as they are needed. It is likely that a large one will be established at Tidewater, although we have not as yet considered a site. At the Dayton training school there are now more than thirty Canadian aviators, many of whom are being trained for service with the British Aviation Corps, and we already have applications for instruction from nearly four hundred young men, who will be accommodated within a few months.

"Orville Wright, who is retained as a Director, and who will be our chief aeronautical engineer, at a large salary, will be in charge of the laboratory in Dayton. He has been criticized in the past for refusing to let the Wright patents be used on terms that would allow the small constructor to do business, and it has been said that he was too selfish with his patents for the good of aviation. This was unjust. Mr. Wright became involved soon after the formation of his company in 1909 in a number of infringement suits, with the result that he was forced to give more of his time to protecting the patents than to promoting their use. Now, however, this will no longer be the case. We will take care of everything. Mr. Wright will continue his life's work of perfecting the aeroplane and we will promote the patents in every way possible. As you see, our advent in the aviation field will promote the manufacture of aeroplanes, instead of throwing a damper on the business."

In reply to a question regarding the stand adopted by the syndicate in the matter of national preparedness, Mr. Jennison said:

"We have had a number of communications from various bodies, and we are for the movement and will co-operate

(Continued on page 138)

## AN EARLY EXPERIMENT IN WATER FLYING



Mr. J. C. McCoy, governor of the Aero Club of America, has kindly allowed the reproduction of the above photo of an early experiment at water flying which he took at Aix-les-Bains, Savoye, France, on the border of Lake Bourget.

"When I was at Aix-les-Bains in the summer of 1906," says Mr. McCoy, "one of the things that came to my attention during a visit to Lake Bourget was an aeroplane equipped with pontoon. As the photograph shows, it was a biplane with two propellers and chain drive, equipped with pontoons. The photograph shows two pontoons, and I am not certain whether there was another float at the rear to float the tail of



the machine. Our party was very much interested in this and we followed the experiments of Mr. Bellamy, the inventor and constructor of the machine for a number of days.

"The machine was kept at times on land, at times on water while experiments were being carried out and various changes made.

"The inventor, Mr. Bellamy, was an English sportsman who had participated in the Paris-Madrid automobile race. The man who had been his mechanic in the race was our chauffeur. Mr. Bellamy attained considerable speed on the water, but undoubtedly the power was not sufficient to rise."



# WHAT GOVERNMENT COMPETITIONS DID TO DEVELOP AEROPLANE ENGINES IN EUROPE

By NEIL MacCOULL

The first use of aeroplanes in the military manoeuvres in France so completely demonstrated their great value that all the leading powers of Europe turned their attentions toward the development of the military aeroplane. It has even been reported that these demonstrations were so far reaching as to prevent a clash between Germany and France at the time of the Morocco crisis—simply because Germany suddenly learned that her aeronautical strength was so much less than that of France that she had but little chance for victory.

It was realized that the value of an aeroplane depended, first of all, upon its reliability, and, since the heart of the aeroplane, the engine, is responsible for its reliability and speed, it was considered necessary to give considerable encouragement to engine builders.

Aside from the large sums of money indirectly reaching the engine builders by means of aeroplane competitions, several competitions were arranged for engines only. Before any governments offered prizes for engines, Mr. Patrick Alexander, of England, offered a prize of \$5,000 for the best British built aeroplane engine. The competition was held in December, 1911, and was won by the four-cylinder 65 h.p. Green engine. This engine made two 12-hour non-stop runs, one on each of two consecutive days, delivering an average of 61.6 h.p. for the 24 hours. The engine weighed 375.1 lbs. with water and radiator, and consumed 1,130.7 lbs. of fuel and oil during the runs, which is equivalent to 18.4 lbs. per horsepower for 24 hours. Other runs were made which showed that the maximum horsepower of the engine was 67.8 and that it was able to operate satisfactorily in inclined positions.

The competition was open to all British engines between 40 and 75 h.p., which did not weigh more than 8.5 lbs. per horsepower based on the weight of radiator and water for a twelve-hour run.

Awards were made on the basis of

- (a) Gross weight per horsepower, including fuel.
- (b) Reliability and steadiness of running.
- (c) Wear.

The E. N. V. engine was the only other to compete, but as it broke down at the start of the second twelve-hour run, the \$5,000 prize was awarded to the Green.

In France several engine competitions were held under the supervision of the Automobile Club of France, one of the most interesting of these being a 100-hour test held in 1913, which covered 13 days, the engines being required to run 8 hours each of the first 12 days, with only half an hour allowed each day for making minor adjustments. The Salmson and Gnome engines both finished this gruelling test.

One of the first competitions for prizes offered by a government was the German competition for the "Kaiser Prize" of \$12,500. Second, third, fourth and fifth prizes were \$7,500, \$6,250, \$5,000 and \$5,000 respectively. The competition was open to all German-built engines of 50 to 115 h.p. at speeds of not over 1,400 r.p.m., thus eliminating the high-speed engine with "geared-down" propeller. One of the interesting requirements was that the engines should be completely assembled in three days.

Awards were made on the basis of weight for brake horsepower, including radiator, and fuel and oil for a seven hours' run. The first prize was awarded to the 100 h.p. Benz, which weighed but 8.4 lbs. per h.p. The second and fourth prizes were won by the 90 and 72 h.p. Mercedes; the third prize by the 97 h.p. N. A. G.; and the fifth by the 98 h.p. Argus, the weight of which was 8.95 lbs. per h.p., not very much more than the Benz. All these engines were vertical and water-cooled, and, with the exception of the six-cylinder 90 h.p. Mercedes, had four cylinders.

## AUTOMATIC CORRECTION OF SIDE SLIP

A correspondent of *Aeronautics* of England offers a plan for the automatic correction or prevention of side-slip. He suggests the use of small "fins" extending fore and aft along the tips of the wings. These fins would be small, compared with the length of the wings, not large enough to give any aid in promoting lateral stability, nor large enough to be affected by side gusts, but still large enough, nevertheless to act as vertical rudders and to steer the aeroplane into a flatter curve than it would naturally take in its steep descent, and ultimately to bring it to an even keel.

In the accompanying diagram

O is the body of the monoplane.

W W the wings.

F F the proposed "fins."

A B the steep path of descent.

A C the flatter curve caused by the action of the "fins."

If  $\alpha$  = the angle of inclination of the curve at any point,

V = the velocity of descent,

A & B = constants depending on the weight and dimensions of the aeroplane,

$t$  = the time elapsed from the commencement of the descent,

$g$  = the force of gravity, then

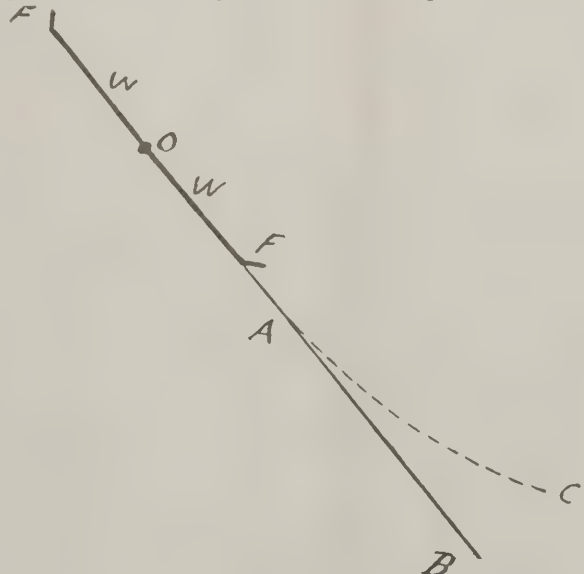
$$-\frac{d^2 \alpha}{dt^2} = A V^2 - B \left( \frac{d \alpha}{dt} \right)^2 \dots (1)$$

$$\frac{d V}{dt} = g (1 - \cos \alpha) \sin \alpha \dots (2)$$

The correspondent adds:

"The complete solution of these equations presents great difficulties, but it is possible to solve them numerically in any particular instance. Approximately, by the method of finite differences, making  $dt$  a constant = 1 second. This I have done, taking the case of an Antoinette monoplane with 46 ft.

spread of wings and weighing 1,200 lbs., starting on a "side-slip" at an angle of  $45^\circ$ . I assumed the "fins" to be one foot deep, inclined at an angle of  $35^\circ$  with the plane of the wing,



this being the angle which gives the maximum turning moment. The point C, where the aeroplane would ride on an even keel, would be reached in about six seconds.

"Of course, I have assumed that the engine is still working and the forward motion of the aeroplane continued.

"Equation (2) is based on this assumption."



## THE NEW THOMAS FLYING BOAT



**T**HE new Thomas Flying Boat, Type B, while differing but little from former models, is one of the most interesting types of this craft that have yet been produced. In producing this machine the makers have spared no expense or pains in offering to the public a soundly constructed and safe passenger-carrying flying boat, having a good speed range and, when fully loaded with gasoline and oil, ample reserve for flights from two to four hours' duration, at a speed of seventy miles per hour with pilot and passenger.

### Dimensions

Over all length, 28 ft. 6 in.; span of top plane, 38 ft.; span of lower plane, 28 ft.; chord, 5 ft.; gap, 6 ft.; total area of planes, 360 sq. ft. Loading, 4.3 lb. per sq. ft.

Hull—Length, 24 ft. 6 in.; top beam, 44 in.; bottom beam, 36 in.; maximum depth, 42 in.

### Hull Construction

The hull is of mahogany with crowned decks, V-bottom forward and hydroplane design, thus securing minimum head resistance with great seaworthiness and comfort in the water. Over the framework of ribs running to a large keelson is ribband planking covered below the water line with metal. There are two cockpits, the forward one for pilot and passenger, and the other for additional passengers and extra gasoline. All seats are luxuriously upholstered with black auto leather and provided with shoulder straps for rough weather.

### Wings

The wings are in six sections, four main planes with two detachable overhanging plans. They are of the latest built-up type with very strong I beam wing spars. The fabric is high grade Irish linen, treated with seven coats of Emaillite and varnished, making it water and moisture proof and very strong and durable.

### Wires

Ample strong standard steel cables of Roebling manufacture are used. The joints are designed for slightly more strength than the wire itself.

### Fittings

All fittings are especially made, are of latest and best design, and are of high tensile steel. Binte (French) turn-buckles, very strong, rust-proof, and of good appearance are used exclusively.

### Finish

All interior wooden parts are treated with a water-proofing solution. All exterior parts of wood and the hull and struts are finished in natural wood. All metal parts are made rust proof by special primers and paints.

### Control

The elevator is operated by pull and push on the steering wheel, which is on a large pivoted post. The elevators are hinged to an adjustable stabilizer. The rudder is operated by rotation of the wheel, which is also furnished with a throttle control. The ailerons are hinged to the outer extremities of the top rear spars. They are operated by foot pedals with comfortable stirrups. The control wires are covered by removable floor boards.

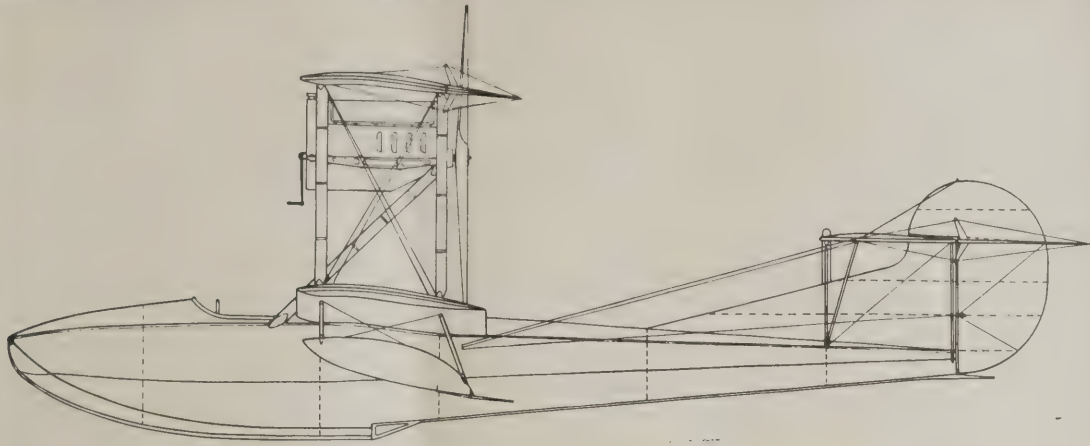
### Power Plant

The 90 H. P. Austro-Daimler motor has been adopted on account of its extreme reliability and all-round efficiency. In design and workmanship this engine is of the best. It uses only nine gallons of gasoline and less than one-half gallon of oil per hour. The motor is mounted on four streamline ash struts, braced with heavy spruce compression members.

(Continued on page 138)



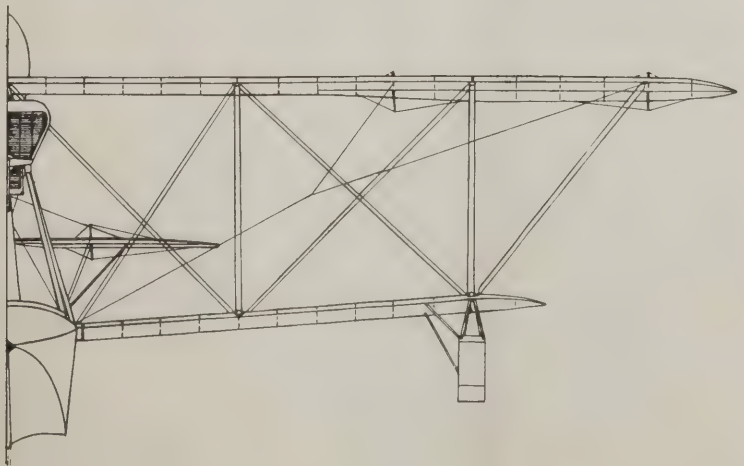
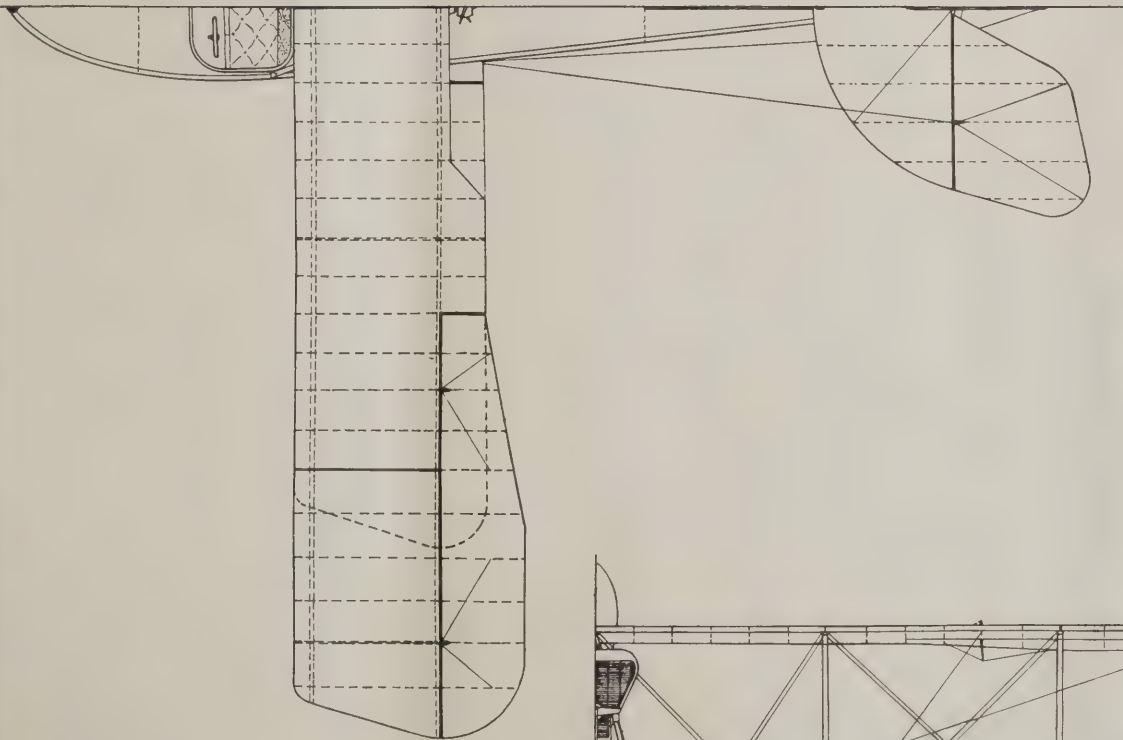




THOMAS 100 H.P. FLYING BOAT

Type B4

(Scale  $\frac{1}{2}$ " to 1')





# THE RIGID DYNAMICS OF CIRCLING FLIGHT

The Third Wilbur Wright Memorial Lecture Delivered  
before The Aeronautical Society of Great Britain.

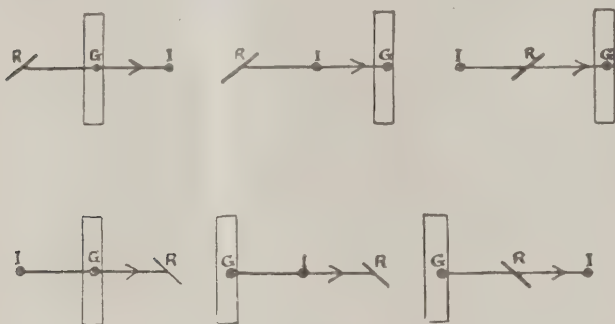
By Prof. G. H. Bryan, Sc. D., F. R. S.

(Continued from last week.)

## XV.—ON THE BEST POSITION FOR THE RUDDER.

29. As an inherently controllable aeroplane is from the nature of the case deficient in lateral stability, the question of placing the rudder plane in such a position as to render the machine stable when used as a fin cannot be definitely decided without having recourse to the methods described in "Stability in Aviation." At the same time there are several general considerations bearing on the matter which may not improbably lead to the right results.

SIX POSSIBLE RELATIVE POSITIONS OF RUDDER, TURNING-CENTRE, & C.G.



Suppose the aeroplane to be in rectilinear motion and to receive a small angular rotation about a turning point  $I$ , this being the limiting position of the turning point for circular motion with a large radius for  $\phi=0$ . Call  $G$  the centre of gravity,  $R$  the position of the rudder, regarded as a fin. Then it will be found that—

If  $G$  is between  $R$  and  $I$  the resistance of the rudder tends to retard both the translational and rotational components of the added motion, which fact suggests probable stability.

If  $I$  is between  $R$  and  $G$  the resistance tends to decrease the angular but to increase the lateral component, thus tending to shift  $I$  further away.

If  $R$  is between  $G$  and  $I$  the resistance tends to decrease the lateral, but increase the angular component, bring  $I$  nearer to  $R$  and causing the machine to curl up in a spiral.

The third alternative seems to indicate evident instability, and even the second seems very doubtful from the point of view of stability. I should infer that when the turning point is behind the centre of gravity the rudder should be in front, and when in front the rudder should be behind. If the turning point ever coincides with the rudder the latter will be ineffectual in maintaining steady circular motion, and it looks as if the machine might become uncontrollable.

As regards the actual position of the rudder, it is probable that the best results will be got when  $R$  and  $I$  are related in position like the centres of suspension and oscillation in a compound pendulum, so that  $GI \cdot GR = -r_g^2$  the square of the radius of gyration of the mass of the aeroplane about the axis of  $y$ .

In treating this as a question of rigid dynamics, pure and simple, we are guided by the same considerations as are assumed in the theory of initial motions, and we for the time leave out all consideration of the air resistances because the changes in these depend on the changes of velocity, which are initially zero, whereas the action of the rudder determines the components of initial acceleration which are finite. This consideration leaves very little doubt about the matter. An examination of some of the problems on initial motion in Routh's Rigid Dynamics will make this clear.

## XVI.—SUMMARY AND CONCLUSIONS

1. In steady motion in a horizontal circle, both the longitudinal and the lateral equations of equilibrium are affected.

2. The turning point may be in front of or behind the centre of gravity, its distance when in front being denoted here by  $c$ .

The axis of the aeroplane then envelopes a circle of a certain radius  $a$ , the real radius of the circle described being  $\lambda/(a^2+c^2)$ .

The system usually cants over sideways through a certain angle  $\phi$ .

3. Given the velocity and radius of the circle it is not usually possible to satisfy the three equations of lateral equilibrium by assigning suitable values to  $c$  and  $\phi$ , but when this is possible the system is said to be inherently controllable.

In an inherently controllable system the rudder planes merely act as guides and it is necessary that they should be so placed as to render the motion laterally stable.

In other cases steady motion can only be maintained by pressure exerted by the rudders or a couple applied by means of ailerons or some such action representing the third unknown variable required for the solution of the three simultaneous equations of lateral equilibrium.

4. In a system of straight planes  $\sin \phi$  is proportional to the radius  $a$  of the envelope, but it also appears that the other conditions of lateral equilibrium are only possible when pressure is applied by means of a rudder and when  $a$  and  $\phi$  have certain definite values. The only way of varying the radius of the circle actually described is by varying the position of the turning point which may be in front of or behind the centre of gravity.

The addition of boxed in ends or vertical partitions improves the steering, but it still leaves  $\sin \phi$  proportional to  $a$ . The inference one would naturally derive from the formulæ is that all such systems would be liable to sway from side to side of the straight path in curved arcs of finite radius. In no case can the radius of the circular envelope exceed the limit corresponding to  $\phi=90^\circ$ .

5. With bent up wings, as in the "Antoinette type," it is possible to satisfy the conditions of equilibrium so that  $a$  is no longer limited and  $\phi$  no longer large. Such a system can be steered in a circle of large radius without being inclined at a large angle.

In general, circular motion can only be maintained when pressure is applied by means of a rudder or a couple applied by means of ailerons, but if the two principal moments of inertia about axes perpendicular to the line of flight are equal, the rudder exerts no pressure and the system is inherently controllable, the inclination satisfying the relation  $U^2 = ga \tan \phi$ .

6. Another kind of "inherent controllability" in which the system always remains level, the inclination  $\phi$  being zero, is possible in certain systems. A necessary condition is that the wings should be bent downwards and not upwards at the tips, and it will be usually advantageous that they should be most bent down at their extremities. The condition representing this fact is that the space between the wings and a chord joining their tips should be as large as possible.

This arrangement of the wings somewhat reproduces the action of gulls' wings in circling flight, and it will be found that differences in the form and curvature of the wings may have a considerable influence in the problems of this class.

7. A third kind of "inherent controllability" is only possible when portions of the wing surface are in front of or behind the rest; and a possible solution exists in the form of a system suggested by me in the AERONAUTICAL JOURNAL\* with front and rear planes, one set being turned upwards and the other downwards.

It appears, however, from the analysis that the necessary conditions cannot be satisfied in the case of surfaces of uniform breadth bent up into a plane dihedral angle at the centre or bent into a trihedral angle at some points intermediate between the centre and tips. They can, however, be readily satisfied by suitably curving the wings or by varying their shape so as to make them as a rule broader towards the tips than near the base. The present arrangement has the further advantage that the system would not tend to turn round sideways if struck by a side gust of wind, and I should consider it worth trying experimentally.

8. Although no attempt has been made to discuss the analytical conditions of inherent stability further than has been done in "Stability in Aviation," it appears from general considerations that the rudder plane at least in an inherently controllable system should be placed on the opposite side of the centre of gravity to the turning point, and that difficulties, probably instability, must necessarily occur if the rudder is between the centre of gravity and the turning point. It seems almost certain that the best position for the rudder is when it and the turning point are in the relative positions of the centres of suspension and oscillations of the system when treated as a compound pendulum.

## PROBLEMS.

1. A detailed examination of the conditions of longitudinal equilibrium in the case of steady circular motion, and of their effects on the conditions of lateral equilibrium.

2. Further discussion of the systems of Section IX.-XI. with special reference to the height of the centre of gravity and the equation of moments about the axis of  $z$ ; in particular complete solutions of the simultaneous equations of Section IX. for a test case such as that of Section X., employing approximations where desirable.

3. Similar complete solutions for four-winged systems satisfying the properties of Section XII., also for lifting planes with stabilisers where these are effective.

4. Application of the analytical methods of my book to investigate the lateral stability of such of the present systems as are not there discussed, and the positions of the rudder consistent with stability.

It will be observed that these problems mainly involve the working out of algebraical details, and to anyone who likes this kind of work they should present little difficulty. I think they may lead to results which it may be desirable to know, as these may affect the practicability of some of the systems here considered. Of the desirability of such detailed discussions sufficient evidence is shown in this paper, the differences between the behaviour of bent and curved wings not being such as could have been or were anticipated when the present investigation was commenced.

The CHAIRMAN: In rising to propose a vote of thanks to Professor Bryan I am sure that it is not necessary to remind those present that the lecture to which it has just been their privilege to listen is the third of the annual lectures founded in commemoration of the late Mr. Wilbur Wright.

It is fitting and appropriate that on the present occasion a few words should be said on the work done by Mr. Wilbur Wright, and more broadly by the Wright Brothers, and on the place which it is anticipated will be given to their work in the history of aeronautical development, when sufficient time has elapsed to allow the work of the Wrights and their contemporaries to be viewed in their true perspective.

At the outset I will make a statement, which, though it may not find universal acceptance at the moment, will, I firmly believe, at some future time be looked upon as fairly representing the truth; I do not think the position of the Brothers Wright as pioneers in the development of aeronautics will be found to rest so much on any scientific work they may have accomplished, but rather upon their achievement as pioneers of the art of flight, of which they were certainly the most distinguished exponents of their time.

(Concluded in next week's issue)





# FOREIGN NEWS



## Argentina

Francisco Beltramo, while attempting to loop the loop in an aeroplane, October 16, fell to the ground and was killed.

## Australia

According to reports in the "Melbourne Age" aero engines of the Renault type are being constructed in Melbourne in quantities. The report further states that they are intended to equip the Maurice Farman Seaplanes which are being built in the same city.

A flying school has been organized at Werribee and already some thirty pupils are enrolled.

## France

During the past week French warplanes have carried out successful raids against railway lines held by the Germans, attacking stations to the north of the Kaiser's line at Bazancourt and near Bapaume and Warnierville. Many bombs of large size were dropped on these stations. The French raids prevented the Germans from assembling infantry divisions which were preparing for attacks against the French lines. A squadron of nineteen aeroplanes threw 140 shells on the railroad junction at Bazancourt. Another flotilla of eighteen air craft attacked Achiet-le-Grand, near Bapaume, and a third force bombarded the railway near Warnierville.

The destruction by a lieutenant of the French Aviation Corps, in the Champagne, of a German captive balloon of the type known as "sausage" is declared to have been a particularly brilliant and difficult feat, for these balloons always are carefully guarded. Determined to get rid of this particular balloon, by means of which the Germans had obtained valuable information about the movements of the French troops, the lieutenant experimented for two months with fire balls. When he was convinced that he had an explosive which met all his requirements he started out for the attack on the balloon. The aeroplanes guarding the balloon, moored fifteen miles behind the German lines, were so vigilant that the lieutenant had to try four times before he could rise above the balloon. On the fourth attempt he swooped down in a giddy flight from a height of 10,000 feet and placed his missiles accurately before the balloon could be hauled down. In dropping his fire bombs the Frenchman came near enough to earth to be in full range of German anti-aircraft guns, but he managed to rise safely and escape in a perfect hurricane of bursting shrapnel.

A battle between a French aeroplane loaded with ninety millimetre bombs and a fast double-engined German plane was one of the incidents of the battle in the Champagne, when the Allied offensive was at its height. The French machine had just set out to destroy a railroad back of the German lines when the German craft emerged from a cloud. The machine plunged in a swift curve, but the German, no less prompt, dived, too, and continued to fly around the French machine, hampered by the weight of the bombs. After firing his carbine until his supply of cartridges was exhausted, it occurred to the French observer that an abrupt landing would be fatal unless the fuses were removed from the bombs. He coolly set about taking out the fuses and had just finished the task when a bullet struck him in the back, and a moment later another shattered one wrist.

The pilot was hit in the eye by a piece of the propeller, which had been knocked off by a bullet. Again he was wounded in the abdomen, and fainted. Then the observer seized the levers and guided the machine into the French trenches.

Both the observer and the pilot have survived their wounds, and the names of both have been proposed for the Legion of Honor.

## Germany

The destruction of a new Zeppelin airship near Brussels on the night of September 7 is announced in advices from Belgium. The Zeppelin while fighting a heavy wind crashed into a cottage and broke in two. All members of the crew were killed.

An official report from Berlin under date of October 12 states that German airmen on the day previous destroyed four enemy aeroplanes. One British aeroplane fell at a point east of Poperinghe. Northwest of Lille Lieutenant Immelmann compelled a British battle biplane, which was flying at a height of 4,000 metres, to descend. This officer within a short time has brought down four enemy aeroplanes.

In the Champagne one French battle biplane was shot down near Somme-Py, another on the heights of the Meuse, west of Hattonchatel. The report further states that one German observation aeroplane was wrecked in the encounter.

## Great Britain

A Zeppelin raid, the most deadly thus far reported, was perpetrated in London on the evening of October 13th. Fifty-five persons were killed and 114 injured. This brings the total casualties from air raids on England up to 640, of which number 177 persons were killed and 463 injured.

The official statement issued was as follows:

"The Press Bureau of the War Office announce that a fleet of hostile airships visited the eastern counties and a portion of the London area last night and dropped bombs.

"Anti-aircraft guns of the Royal Field Artillery attached to the central force were in action and an airship was seen to heel over on its side and to drop to a lower altitude.

"Five aeroplanes of the Royal Flying Corps went up, but owing to atmospheric conditions only one aeroplane succeeded in locating an airship. This aeroplane was unable to overhaul the airship before it was lost in the fog.

"Some houses were damaged and several fires were started, but no serious injury was caused in military material. All fires were soon got under control by the fire brigade.

"The following military casualties, in addition to the one announced last night, have been reported:—Fourteen killed and 13 wounded.

"The Home Office announces the following casualties other than the military casualties reported above:—Killed—Men, 27; women, 9; children,

5; total 41. Injured—Men, 64; women, 30; children, 7; total, 101.

Totals, killed and injured:—Men, 91; women, 39; children, 12; total, 142.

"Of these casualties, 32 killed and 95 injured were in the London area, and these figures include those announced last night."

Following the raid the German Admiralties gave out following statement:—

"German airships during the night of October 13-14 attacked the city of London and nearby important establishments, as well as the batteries of Ipswich.

"Several attacks were made, especially on the city of London.

"The docks of London, the water works at Hampton, near London, and Woolwich also were heavily bombarded with incendiary bombs.

"At all the places attacked important explosions and great fires were observed.

"All the airships returned safely, although they were vigorously attacked on passing over the English coast."

The raid has resulted in a strengthening of the campaign being waged for reprisals by the British along the same line. Recruiting has been stimulated by the event.

Reports relative to an accident of one kind or another to Claude Grahame-White continue to crop up. The rumors current in New York of his death were prevalent in London also but were easily disproved. He paid a visit to various newspaper offices to show that he was alive and well.

Flight Lieutenant Lord, one of the best known aviators in England, was killed in a single-handed combat with the Zeppelin that attacked Margate on September 15, according to mail press despatches. According to spectators who witnessed the uneven duel between Zeppelin and aeroplane, Lord circled around his huge opponent three times, firing a machine gun. Tongues of flame spurted from the sides of the Zeppelin, but the German bullets missed their mark as Lord zig-zagged and volplaned. As he steadied his machine for a final fusillade the German gunners got the range. The aeroplane crumpled up before the blast of bullets and dropped, a heap of wreckage, with the dead aviator beneath it, at the feet of the horrified spectators upon the beach. The Zeppelin hovered for a few minutes over the town and then disappeared. The British public is still unaware of the tragic end of Lord, so closely are incidents of this kind guarded by the censor.

Press despatches state that a recent raid of British aviators on Ghent and the neighboring town of Gontrode was so successful that not a single hangar on the German aviation grounds was left standing. All of them, with their contents, were burned by incendiary bombs. Ten houses also were burned. The last airship raid on Ghent which has been reported occurred on August 31, when it was said the aviators destroyed a large building at Ghent which was used by the Germans for housing air craft.

## Holland

The four Zeppelins, believed to have participated in the recent raid on London, flew over Holland on their return journey and were fired on by Dutch sentinels, in accordance with the recent orders. According to one report, the LZ-77 was crippled, and disappeared toward the German frontier, moving erratically.

## Italy

On October 9th fourteen Italian aeroplanes bombarded Austrian headquarters at Kostanjavica, causing considerable damage.



Friedrichshafen, Home of Zeppelin.

Photo by Ruschin





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1363 Townsend Avenue, Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 130, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**HARLEM MODEL AERO CLUB**  
73 West 106th Street, New York City  
**MILWAUKEE MODEL AERO CLUB**  
402 Bradford Avenue, Milwaukee, Wis.  
**CONCORD MODEL CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**AERO CLUB OF ST. LOUIS**  
Columbia Bldg., 8th and Locust Streets, St. Louis, Mo.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

## NATIONAL MODEL AEROPLANE COMPETITION

### Hydro Contest

#### Final Results

Like the first club contests in the series of Model Flying Contests, held under the auspices of the Aero Club of America, the close of the second of the series has produced a new world record.

In the first series, held during August and participated in by members of Model Flying Clubs in various sections of the country, Wallace A. Lauder of the Summit, N. J., Model Aero Club established a new world's record for distance with a model launched by hand, flying 3,537 feet. In the second series for duration with models rising from the water, Lindsay Hittle of the Illinois Model Aero Club established another world's record. After rising from the water his model hydro-aeroplane remained in the air 116 seconds, doubling the best previous record in this class, which record had been held by G. A. Cavanagh of the Aero Science Club. Mr. Hittle's record is the more remarkable because it was made with a single propeller, tractor monoplane hydro-aeroplane, a type of model that has given makers considerable trouble, yet Mr. Hittle's new record is far in excess of the best previous record with this type of model, even when launched by hand.

So pronounced has been his achievement that there is great curiosity among model builders. We expect to give detailed information in later issues of AERIAL AGE.

In the duration-from-water contest Ellis E. Cook, also of the Illinois Club, won second place, with a record of 100 seconds, and Pease of the Illinois Club was third with a record of 71 seconds. All three contestants surpassed the world's official hydro record of 60 seconds.

In several instances the contestants in Eastern Model Clubs flew their models under adverse conditions. In Concord, Mass., the models had to rise out of a river in a valley where atmospheric conditions were unfavorable. At Garden City, L. I., the contestants used an improvised tank, which was not long enough to accommodate slow-rising models, and some of them dashed against the end of the tank before actually getting under way. The pontoons of those models that succeeded in rising were cut to pieces by stones as they came down.

But the series, as a whole, has been gratifying in its results, not the least among which has been the increase of interest in the art. A new club has been formed at Springfield, Mass., and inquiries received from other points indicate the very probable starting of other clubs. Toronto, where aeroplanes are being built for export and aviators are being trained for war, will probably have a model club in the near future.

The third and concluding contest in the series between the clubs will be held during the present month, a duration contest for models rising from the ground. While the events of this final contest may greatly alter the relative standing of the clubs, present indications are that the Villard trophy will go to the Illinois Model Aero Club, with the Pacific Northwest Club a good second.

The summary of the second series (duration; rising from water) are as follows:

Illinois Model Aero Club					
Best Flight					
Lindsay Hittle.....	116 sec.	82.4	70.6	269	89.6
Ellis C. Cook.....	100.6 sec.	98.4	57	256	85.3
Ward Pease .....	71.8 sec.	45	0	116.8	38.9
William Schweitzer....	53.8 sec.	38.8	0	92.6	30.8
Total.....					244.6
Club Average.....					61.1

### Pacific Northwest Model Aero Club

Pacific Northwest Model Aero Club					
	Best Flight			Total	Aver.
Rene Valadon .....	40	38	17	95	31.6
Lawrence Garrick....	40	30	20	90	30
Frank Barney.....	27	20	12	59	19.6
Robert La Tour.....	45	43.5	17	105.5	35.16
Total .....					116.36
Club Average.....					29.09

### Harlem Model Aero Club

		Best Flight	Here		Total	Aver.
Harry Schultz.....		37.1 sec.	3.2	2.3	42.6	14.2
A. K. Baker.....		43.4 sec.	39.2	8.3	121	40.3
James Barker.....	(wrecked)					
G. Bauer.....	(wrecked)					
Total.....						54.5
Club Average.....						13.6

### Detroit Aero Research and Model Club

		Best Flight		Total	Aver.
Maurice Guy .....	35	30.5	0	65.5	21.8
Wm. P. Dean.....	29	21	0	50	17
Horace Dean.....	28	10	0	39	12.6
Reginald Brown.....	0	0	0	0	0.
Total .....					51.4
Club Average.....					12.8

### Concord Model Aero Club

	Best Flight		Total	Aver.	
William F. Schult....	30.2 sec.	29.6	25.2	84.8	28.2
Waid Carl.....	17.8 sec.	12.4	6.2	36.4	12.1
Earl H. Bean.....	24.2 sec.	5	0	29.2	9.7
Benjamin Smith.....	3 sec.	0	0	3	1
Total .....					51
Club Average .....					12.7

### Texas Model Aero Club

		Best Flight			Total	Aver.
Hamer Smith.....	19.1 sec.	19.1	13.4		51.6	17.2
Dwight Bourn.....	29.1 sec.	21.2	17		67.3	22.4
Total .....						39.6
Club Average.....						6.9

The other clubs in the vicinity of New York City competed, but without results. The judges who officiated at the Contest held at Garden City, October 3rd, were Mr. Henry Woodhouse, Mr. G. Douglas Wardrop, Mr. Burt McConnell, Mr. Arthur Heinrich.

### Aero Science Club of America

The following members were selected to represent the Aero Science Club at the R. O. G. contest, the last of the series to be held under the auspices of the Aero Club of America, and for the Inter-Club Trophy, offered by Mr. Henry Villard: Meyers, Broomfield, Thiele and Cavanagh. Substitutes, Lott, Funk, King and Hodgins.

The Aero Science Club, in its efforts to increase interest in model flying in America, is seeking affiliation of all model clubs in America, and up to the present results have been very satisfactory. At the last meeting it was announced that the Illinois Model Aero Club will co-operate with the A. S. C. under conditions set forth. Mr. Schultz, publicity manager, assisted Messrs. Barker, Meyers and Cavanagh, secretary, are planning a campaign for the winter months which is expected to result in many new members.

Mr. Cavanagh will go to the Y. M. C. A., Orange, N. J., during the week of October 18, and will talk over matters pertaining to model aeroplane building and flying during the winter months. Much interest was shown at the past Boy Scout rally, held in East Orange, which offers a promising field for development of the sport.

During the series of Inter-Club contests for the Aero Club of America prizes and the Villard Trophy, various

(Continued on page 138)





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### The Result of Zeppylings!

Rain was falling steadily as the weary cyclist plodded on through the English mud. At last he spied a figure walking toward him through the gloom.

Gladly he sprang off his machine and asked the native:

"How far off is the village of Poppleton?"

"Just ten miles the other way, sir," was the reply.

"The other way!" exclaimed the cyclist. "But the last sign post I passed said it was in this direction."

"Ah," said the native, with a knowing grin, "but, ye see, we turned that their post round so as to fog those e'er Zeppylings!"

#### An Echo of an Air Raid

Scene: Night in the Eastern English counties. A Zeppelin, brilliantly illuminated by search-lights and festooned with shrapnel, is observed approaching. A National Guard (with gun) enters O. P. followed by his wife.

National Guard, sighting for the Zep.: "I really believe I could pot the beggar."

Wife (alarmed): "Oh! Charles, please don't irritate it."

—*Financial Times*.

#### Ma Goose on the War

Zeppelin, Zeppelin, where have you been?

I've been to London to frighten the Queen.

Zeppelin, Zeppelin, what did you there?

I dropped forty bombs and made a great scare.

—F. G. B.

#### An Aufu' Job

The Government official had been telling a simple old Scotch farmer what he must do in the case of a German invasion on the east coast of Scotland.

"An' hae reely tae dae this wi' a' ma beesties if the Germans come?" asked the old fellow at the finish.

The official informed him that such was the law. "All live stock of every description must be branded and driven inland."

"Weel, I'm thinking I'll hae an autu' job wi' ma bees!"

#### Little Tragedies

"A rose between two thorns am I—"

He sat between two maidens shy;

He's singing anthems in the sky.

—*Brownie*.

#### An Epitaph

Here lie the bones of Hiram Blaine,

Who trusted to his feet,

And wouldn't take an aeroplane

To cross a jitney street.

—*San Francisco Chronicle*.

#### Famous Lady Killers

Bluebeard.

Henry VIII.

Francis X.

The Zeppelin.

Hush boys! cried the mother, don't make so much noise. Mr. Smith, the landlord, is flying around and he is likely to drop in at any moment.

I hear Jones the aeronaut was arrested the other day?

Yep! He landed on Judge Man's field last week and was sent up for 30 days.

Old Man: It seems as though I can never get my drinks mixed properly.

Young Man: Why don't you "Tri Plane" whiskey?

Old Man: I guess I will. The next time I'll "Bi-plane."

Everybody was aroused by a crash at the rear of the house. All hands quickly made way downstairs to the rear, and there saw a heap of wires, sticks, cloth, etc. Pulling aside some of the debris one of the household espied the manipulator. Are you hurt, old man? he asked. Oh, no! I just thought I would drop in and see if everything was all right.



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The Close of the Campaign of Frightfulness.

Courtesy of N. Y. Globe.



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NEW YORK CITY

(Continued from page 132)

Two twelve gallon tanks in the hull, under the center of gravity, carry the normal load of gasoline. The gasoline is fed to the carburetor by the Stewart Vacuum System.

**Weight**

The boat, complete but unladen, weighs about 1,250 pounds.

**Speed**

The actual speed, fully loaded, is 55 to 70 miles per hour.

**Standard Equipment**

All Thomas Flying Boats are equipped with the following accessories: On the dash-board,  
Engine revolution counter.  
Air speedometer (Pitot Tube.)  
Aneroid barometer, for altitude.  
Inclinometer, for angle of flight.  
Air pump and pressure gauge, for the gasoline.  
Dash-board clock.

There are also supplied a 10 lb. folding anchor with rope; a removable axle with wheels for hauling on shore, and a complete set of strong, light shipping crates.

(Continued from page 130)

in every way to make it a success. One of the greatest needs of this country is an efficient and sufficiently numerous fleet of aeroplanes, as has been demonstrated by the European war, and every member of the syndicate feels that the United States should be properly protected in the air as well as on land and sea.

"Contrary to rumors that have been circulated, there are none but Americans interested in the new Wright Company. Neither the Allies nor any other foreigner has representation in the company, and it is the policy of the company to build American machines with American labor, for a world-wide market."

**Katherine Stinson To Fly in Tucson**

Katherine Stinson, the 17-year-old girl who has established a name for herself in the aeronautic world, has been engaged to make flights at the Southern Arizona Fair, which will be held in Tucson, Arizona, November 4, 5 and 6.

**Bocquel's Daring Pleased Californians**

Joseph Bocquel made a hit at Reddings, Cal., where he gave an exhibition that local papers say was not surpassed in interest by any of the more famous aviators at the San Francisco Exposition. He went up in a new and little-tried machine and made his first loop-the-loop for the benefit of Reddings people, and though the crowd was pleased the aviator himself was disappointed because engine trouble prevented him from giving a longer flight than he had contemplated. During the flight one cylinder failed and by the time he got back to field three cylinders were dead. In landing he struck bad ground and several minor parts of the machine were broken. Bocquel flew a Christofferson.

(Continued from page 136)

model records have been broken. The making of these new records has greatly increased the interest in the sport, and letters are being received daily at the offices of AERIAL AGE asking for information concerning these models. With this fact in view, the model editors of AERIAL AGE kindly ask for photographs, drawings and descriptions for publication from those flyers who have broken world's records. The publishing of these models, aside from being appreciated by those interested, will help to further the interest already aroused.

Newly designed compressed aid motors were shown by Mr. Frank Schober at the meeting. Mr. Schober has sent photographs and drawings of his new four-cylinder horizontal motor, which he expects will appear in a subsequent issue of AERIAL AGE. At the symposium of aeroplane engines, to be held at the Engineers' Building, New York, under the auspices of the Aeronautical Society, Mr. Schober will represent the Aero Science Club.

This contest will be held during the afternoon of October 24, at Garden City, L. I. The Summit, Bay Ridge and Harlem model clubs will fly on the same day.

For further particulars, address the Secretary, 29 West Thirty-ninth street, New York City.

**Illinois Model Aero Club**

By Ward Pease

At our last meeting Mr. Lindsay Hittle gave us a talk on his 116-second tractor hydro, which was very interesting and instructive. Rules for the indoor meets of the coming winter were announced by the contest committee, and it is expected that there will be something more than the interest aroused to be gotten out of these contests in the line of scientific advancement, for the rules are of such a nature that the models will resemble man-carrying aeroplanes in many respects, so there will be problems met and solved such as one would meet in the construction of a large aeroplane. These meets may not be in vain, for there promises to be quite a large crop of Chicago boy aviators, who build their own machines from their experiences with models. Laird has just finished a very successful exhibition season in the middle west, and is about to commence on a 50 h.p. Gnome motored tractor with which to loop next season. Harry Wells has recently brought out his light little tractor biplane, but is hindered just at present with motor trouble. He will follow Laird into the air in the next week or two. Charles Arens has obtained an Anzani 35, and has started work on his tractor. Lindsay and Hittle have designed a tractor to fly on 2½ h.p., and intend to start work on it at once. Three other boys have formed a partnership and planned a machine, while others are making their plans.

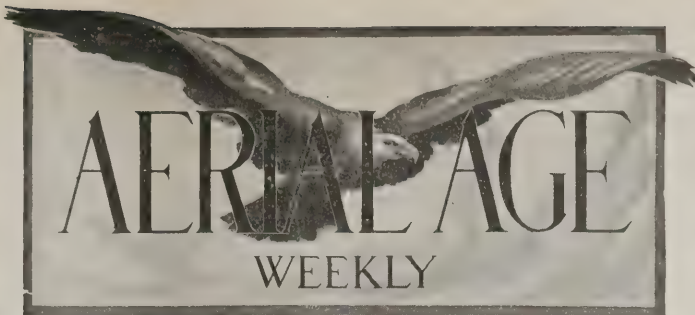
The scientific committee has got down to business and will have some data on propellers and wings for us at our next meeting.



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VOL. II

NEW YORK, November 1, 1915

No. 7

### Obsession or Ignorance?

WE print herewith a letter from the President of the Pensacola Chamber of Commerce objecting to our editorial of October 4th—one of half dozen editorials printed in *Aerial Age* in the past eight months pointing out the inadvisability of manufacturing of aeroplanes by the Government.

Part of the letter dwells on points which had been fully covered in editorials last March, April and May, and for that reason were not again brought out in the editorial October 4th. Another part of the letter shows an amazing obsession—which, if entertained by officials of the Navy at Washington, is positively a National danger.

The Navy needs at least five hundred aeroplanes. We would be unprepared if we had fifty; we have had an average of less than five in commission at Pensacola since the school was opened, and the machines ordered do not number one dozen. Supposing that with the machines available, those ordered, and the ghosts of machines that are in dis-repair the Navy Department can claim to have twenty aeroplanes at the end of this year, and supposing further that by including Lieutenants Towers (who is in London), Herbster (who is in Berlin), and Smith (who is in Paris), and the officers who are filling positions in various shops and departments at Pensacola and the students who have not yet completed their course of training, supposing that by counting all the naval men who have taken up aviation in the past or are under instruction, the Navy Department can show a list of twenty-five men—can the Navy Department properly tell the country that it is planning to employ this meager personnel and the very small appropriation suggested for next year in attempting to manufacture aeroplanes instead of investing all its resources in training and equipping more men?

So long as the aeronautical appropriation is less than \$5,000,000 a year and the Navy has less than one hundred trained aviators and less than four aviation stations in the United States and at least one station at the Panama Canal, the Philippines and Hawaii, the Navy needs all the money appropriated and all the trained men available to turn out and equip flyers.

The fact that after four years of developing we can only—and with considerable stretching of one's imagination—see twenty aeroplanes and as many aviators in the Navy at the end of this year is the strongest evidence that the Department is not in a position to undertake manufacturing of aeroplanes, whether under the guise of experimentation or otherwise.

The statement that the Navy had "to furnish to one of the private manufacturers detail drawings to show him how to build a certain type of aeroplane so that

it would fly" can only be called absurd at a time when our constructors turn out such wonderful types of aeroplanes as the "Canada" and the "Super-America" on practically no notice at all. It shows ignorance of the present manufacturing conditions in the United States. Sixteen aeroplanes are being shipped from this country each day to European countries, to be used in actual warfare. The fact that the orders have been repeated and increased repeatedly is evidence that full satisfaction has been given.

Comparing the United States ordinance with aeronautics is not quite possible—not with Secretary Daniels' proposal to ask for only \$2,000,000 for naval aeronautics for next year.

If the Navy Department only wants to experiment then, it should use the extensive experimental facilities which it has at Washington. This has already been mentioned editorially in *Aerial Age*.

The last paragraphs make us sick at heart. It is the composition of a man with a hypercritical mind, who does not know of the past and does not appreciate the assistance rendered by the constructors to the Navy in the past, does not know that they bore the heavy cost of experimentation for the Navy, and did business at a loss, so as to co-operate in advancing aviation in this country. Not knowing of those struggles of two and three years ago, and of the fact that on account of lack of governmental support the aviation industry in this country until a few months ago was only an infant, he lists occasional faults of materials and attempts to build a case against the youthful aeronautical industry.

Furthermore, he claims to be interested in the welfare of the men who fly.

We can only say that we are sorry for the naval aviators who have to do their work under such influences and we shall from now on be doubly watchful of what is taking place at Pensacola.

The letter under discussion follows:

PENSACOLA, FLA., October 4, 1915.

To the Editor AERIAL AGE:

Your issue of September 13th, which came to my notice only recently, contains an editorial headed "Blunder or Pork Barrel," inspired by a clipping from the Jacksonville *Times-Union*, which states that the Government is to do aeroplane manufacturing at the United States Naval Aviation Base at Pensacola. You violently attack this policy. The tone of your editorial may be shown by quoting your statement that "the efforts of the politicians who want to get the one million dollars which the Navy has offered for aeronautics, are about to prevail," and "True, the time for the presidential election is drawing near, and Senator Nathan P. Bryan believes he can produce votes." Your article is on a parity with a great many others which have been written recently in regard to various naval matters, which do not present clearly all the



facts, but offer a one-sided and evidently prejudiced statement.

You say that "the meager resources available are to be squandered in an experiment which failed in England and France," and that "There is . . . not even the most distant possibility that our distracted naval executives could succeed where the thoughtful British and French naval authorities failed." The experiments of the Royal Aircraft Factory in England have produced aero-dynamic data which has served as a guide for the greater part of Europe. As a result of the experiments there, the English Army and Navy aviation experts know more about aeronautics than any private manufacturer in the United States, and have instructed, recently, some of the biggest manufacturers here how to build their craft so that they will stand, to some degree, the strain of war. Recently, the Naval Aeronautic Station at Pensacola had to furnish to one of the private manufacturers detail drawings, although he had full specifications, to show him how to build a certain type of machine so that it would fly. You also quote certain bureaus of the Navy Department as opposed to this building policy. Their opinion applied to the general manufacture of air craft, to the exclusion of private manufacturers, something, I am informed, that is not now and never has been contemplated by the Navy Department.

The United States naval ordnance is now as good as any in the world, because the Government itself, through its naval officers, made its ordnance fit by doing its own manufacturing, and applying to design and construction the ideas of men who got them from the use of naval guns under service conditions.

It is not the intention of the Navy Department, as I understand it, to build all its aeroplanes, or even a majority of its aeroplanes, at Pensacola, but it is the idea, I think, to have at Pensacola a plant for experiment and to produce a certain number of aeroplanes, located at the place where the major portion of the naval flying is done supervised by men who fly themselves, who are seamen and know all the needs; not only those which may be known by a theoretical expert at an inshore factory, but those that experience with the sea winds and waves have taught.

The needs of the naval aviator, in a machine for carrying him above the water, are different from those of a flyer over the land. He wants more horsepower with less weight, for his machine is heavier; he wants capacity for sustained flight; he wants pontoon arrangement which will allow him to alight on or arise from the surface of the water; he wants a general structure that will best suit storing aboard and launching from a naval vessel. Will he get from the private manufacturer the study, investigation, and patient experiment necessary to meet these needs? Past history does not indicate it. Why, then, should not the Government experiment for itself and construct for itself; not entirely, but as a leader, a pace-maker, for private manufacturers?

Judging by the past and present, private manufacturers need such a pace-maker. There is not a motor in this country, adapted for use in seaplanes, that can be relied upon to run for five hours without breaking down. They should run double or triple that time. There is not a motor made in this country that, under naval tests, will develop over 85% of the horsepower claimed for it. There has been too much desire to reap the harvest and too little to do exact and painstaking work. There have been machines furnished the Navy which could not be set up until they were partially built over. There have been cracked castings, badly balanced machines, parts that would not fit, shafting that broke under the first stress. In fact, it has been made as an official recommendation, time and again, by one of the leading naval aviators that no more machines be purchased from a certain prominent manufacturer until he took steps to remedy the almost criminal carelessness with which his machines were constructed.

It would be well for you, in your zeal for the private manufacturer and for the profits of private enterprise, to have regard for the men who must hazard their lives in these machines and, therefore, may well have a voice in designing and constructing them. It would be well for you, before impugning the motives of a conscientious and capable senator, to inquire whether his efforts are not at least as patriotically inspired as yours and whether his services to the cause of naval aviation, in endeavoring to secure thorough experiment and careful construction by those whose knowledge has been gained by practical flying experience, are not greater than you render by your intemperate attack.

Very truly yours,

C. E. DOBSON,

President, Pensacola Chamber of Commerce.

### Our Eagle Without Wings.

THE leading article in the November number of the *Metropolitan* magazine is given to a substantial article by Richard Harding Davis, entitled "Our Eagle Without Wings."

It is a very interesting article, full of striking paragraphs and "meat." Here are examples:

"When in December the legislators return to Washington, with the fear of God thrown into them by those who demand national defense, they may vote less for 'pork' and more for preparation. But we cannot be sure of that. They may give us very little. In consequence, it is the part of 'preparedness' to consider now how, to the best advantage, that little may be spent.

"What does our army and navy most need? At what point are we most vulnerable? Keeping in mind that the sum voted for defense will probably be entirely inadequate, what weapon among the many we lack would give the best service for the least money? In seeking the answer we must be guided entirely by the lessons of the present war. What we learned in past wars is not going to help in the future. As late as the South African War and the Cuban campaign I have seen attacks directed by a man on a skyline wigwagging with a flag. He exposed the position of his own troops, he drew upon them the fire of the enemy, and at a distance greater than two miles his signals could not be seen. And he personally was killed. In this war officers seated around a table in Paris speak fifty miles away to an officer buried like a mole in the ground; and he presses a button, and a battery he cannot see hurls salvos of shells nine miles at an enemy it cannot see. Black powder, which was used as late as the Spanish-American War, today would be as welcome on the firing line as asphyxiating gas. Weapons that a few years since were worth their weight in gold dust, are now thrown on the scrap heap. Shrapnel shells have given way to 'H. E.' shells, the despatch rider on a galloping horse has been overtaken by the man on a motor cycle, and the motor cycle by the field wireless. A navy officer has told us that in a sea fight between ten battleships of our *Oregon* type, the ship that made the record cruise around the Horn from Seattle to Santiago, and one *Queen Elizabeth*, victory would lie with the dreadnought.

"And the dreadnought is at the mercy of a submarine, and the submarine is helpless under the spying eyes of an aeroplane. So also is an army corps.

"If the war has taught anything it has taught the greater value of the man who works in the sky, over the man who paddles about in the sea or crawls upon the ground. It has taught that aeroplanes will increase the effectiveness of any army and navy from fifty to seventy-five per cent.

\* \* \*

"Since then the 12 aeroplanes belonging to the navy, 'with too little speed and carrying capacity,' have been reduced to six.

"At the present moment in this country the output of the different factories *each week is eighty-five aeroplanes.*

"They are all being shipped abroad to help the Allies—and good luck go with them—but, in the meantime—we *have twelve.*

"Last July a man who had invented a machine for launching torpedoes from airships asked Secretary Daniels if it might be 'tried out' on an aeroplane of the 'America' model. Mr. Daniels said, 'That type is no good. The navy is not going to use it.' At the time Mr. Daniels came to judgment upon that particular type of airboat, the original 'America,' as I have already stated, had destroyed three submarines, and for nine months, with eighteen other 'Americas' had been constantly on active service in the English Channel. Of these American made airboats, Russia and Italy are using twenty. Mr. Daniels knew the 'America' only as the airboat that did not cross the Atlantic. She did not cross the Atlantic in the fashion she first intended, because the British Admiralty brought her for war work. Mr. Daniels did not know that. He knows it now. He also ought to know that the tiny kingdom of Holland, and Holland is not at war, and the tiny republic of Portugal, and neither is Portugal at war, have each placed orders in this country for twenty 'Americas.'

"Twenty 'Americas' for Holland, and twenty for Portugal.

"And we have none.

"Because we have only twelve aeroplanes, in the army and navy we have even a less number of aviators. Without aircraft you cannot make air pilots. Men cannot learn to handle an aeroplane by attending a correspondence school.

"The blame lies at the doors of Congress and the Senate. Congress refused to vote money to buy the aircraft and in consequence in the army and navy we have less than twelve trained aviators. It goes back further than that. In no branch

(Continued on page 162)



# THE NEWS

## Two New Navy Sea Planes

Two new hydroaeroplanes have been delivered to the navy for use in developing the aerial fleet of the government. One is a Curtiss hydroaeroplane of the Ah-3 or "school machine" type, and one a Burgess-Dunne seaplane. Both have been sent to the navy aeronautic station at Pensacola, Fla. Two other new Curtiss hydroaeroplanes, designated as Ah-13 and Ah-14, were also received at the Pensacola station the week of October 4 and have been successfully tested and turned over to the flying school for the use of the naval aviators.

## First Navy Balloon to be Tested Soon

Lieutenant-Commander Frank McCreary, of the department of naval aeronautics, has arrived at New Haven to look over the first of the Navy's fleet of balloons being built by the Connecticut Aircraft Company. The officers of the company announced recently in reply to a story from Washington to the effect that the Government was dissatisfied with the failure of the company to have this machine ready for testing on October 4, that the machine was practically in readiness as soon as a hangar was provided, and that an early inspection by Government officials was desired. It was pointed out that when the contract was given it was understood that the balloon was to be shipped to the Pensacola aeronautic station, where it was to be tried out. The hangar there, however, has not been completed. It is proposed, therefore, to find, if possible, a place in Connecticut where the machine can be assembled. When asked if he would make a final report on this dirigible or if this inspection was only a preliminary one, Commander McCreary said: "I shall be here for the finish. I am now looking over the working plans and going over the specifications and the various parts of the machine. I shall stay until a place is found where the machine can be assembled and the final inspection completed."

"Capt. Mark L. Bristol, in charge of the office of naval aeronautics, is at present on a tour of inspection of the different aircraft plants, and whether or not I cannot say, but we are in hopes that he will give us a visit."

"According to newspaper reports, Capt. Bristol has said that through the use of dirigibles and aeroplanes we could make it impossible for a hostile fleet to approach our coast unexpectedly, and that we could prevent the possibility of a foe getting close enough to bombard any coast city. He is credited with the statement that with an adequate fleet of dirigibles and aeroplanes we could build up a coast defense that would absolutely protect New York, Philadelphia, Boston, San Francisco and other sea coast cities from an enemy. The plan is entirely feasible and practicable."

The final specifications of the working drawings of the dirigible which Commander McCreary is looking over call for a machine 175 feet long, its maximum height fifty feet and its greatest beam thirty-five feet, with the greatest beam of fins fifty feet. The maximum speed will be between twenty-five and thirty-five miles an hour, and it will be capable of maximum speed for five hours. The volume of

## Beryl H. Kendrick to Fly From Albany to Cape Hatteras

Just as we are about to go to press, we are informed that a flight from Albany, New York, to Cape Hatteras, North Carolina, a distance of approximately 750 miles, is to be made by the sportsman-aviator Beryl H. Kendrick, of Atlantic City, in competition for the Curtiss Marine Trophy. Mr. Kendrick will use the 100 h.p. Curtiss flying boat with which he has been carrying passengers all summer at Atlantic City. While at Atlantic City the demand for flights was so great that Mr. Kendrick was compelled to use the machine, not only each day, but on every moonlight night.

The flight, which is the longest that will have been undertaken in the competition for the Curtiss Marine Flying Trophy, will be down the Hudson River, and along the coasts of New Jersey, Delaware, Maryland, Virginia and North Carolina to Cape Hatteras. Mr. Kendrick has given official notice to the Contest Committee of the Aero Club of America, and they will accordingly appoint judges and observers to witness Mr. Kendrick's start and his flight past certain points on the coast. It will be necessary to take on



The Curtiss Flying Boat with which Truman H. Post is doing such good missionary work around New York City.



Navy. His idea is to appoint aviators from civil life without requiring them to pass through the Naval Academy. They will receive commissions, but will serve in no other capacity than as aviators.

To date the Navy has issued aviator licenses to only eighteen officers. These are line officers who have been assigned to special duty as aviators. Under the new plan which is being worked out in detail by Rear Admiral Victor Blue, chief of the Bureau of Navigation, for the approval of Secretary Daniels, it is the expectation that the Navy may draw upon the best talent in the civil life of the country, now or hereafter engaged in aviation. The aviators will serve for definite terms and will be part of the Navy, just as line and staff officers.

The progress of aviation in the Navy is now impeded by the lack of aviators and by the fact that there can be no officers in the corps except graduates of Annapolis. Under the new plan the Navy would obtain its aviators not only from the commissioned personnel of the Navy, but likewise from civil life. Mr. Daniels believes there are many able young aviators who would join the corps if they had the opportunity, and that the Navy, as well as the Army, should not be deprived of the benefit of their services. From his talks with those in charge of the Navy aviation, Mr. Daniels is convinced that a man to become a successful aviator must possess a sort of a sixth sense, and that it is not possible for every man to develop it.

Aside from the eighteen naval aviators there are young men who are being trained as aviators, but only eighteen have finished the prescribed course laid down in the regulations to enable them to qualify for licenses. It is felt that it would require too much time for the Navy to wait for a sufficient number of officers to develop as aviators and for this reason Mr. Daniels has taken up the new plan.

#### New Thomas Seaplane Soon To Be Tested

Owing to delays in delivery of materials, the first Navy seaplane and the first of the 135 h.p. Military Tractors remain as yet untested. At the time of this writing, however, the Seaplane is being taken to the Lake, and at the first appearance of favorable weather will receive its Navy acceptance trials.

#### Beckwith Gets First Thomas Motor

The first motor produced by the Thomas Aeromotor Co., of Ithaca, has been delivered to S. F. Beckwith at Hempstead, Long Island, for use in his new type biplane tractor.

#### Aircraft Company Makes Tests at Bound Brook

The Aircraft Company recently made tests at Bound Brook of a new machine designed by Walter Blakeley. The plane was seen circling through the air at a height of 2,500 feet and seemed to have great stability and speed.

Previously the Aircraft Co. made a test with an aeroplane three miles from Bound Brook. The machine is said to have risen to a height of 8,000 feet, to have attained a speed of 90 miles an hour and to have remained in the air more than four hours.

Head, N. J., and later in the afternoon at Ocean City, Md., and it is expected that the distance will be covered within ten hours.

It is expected that the results of four other flights will be received by the Aero Club shortly. These are William E. Boeing, President of the Aero Club of the North West, who will fly a 150 h.p. Martin seaplane, and who will represent the Northwest Aero Club, and Mr. Glenn L. Martin, who will also fly one of his 150 h.p. seaplanes, representing the Aeronautical Society, of California; Lieut. H. A. Dargue, U. S. A., who will fly a Martin seaplane equipped with an 80 h.p. Curtiss Motor, representing the Aero Club of America; Robert G. Fowler, who will fly a Burgess-Dunne seaplane, equipped with a 100 h.p. Curtiss Motor, representing the Pacific Aero Club.

#### Navy To Have Civilian Fliers

Secretary Daniels has decided to submit to Congress a plan for the creation of an enlarged aviation corps for the



What the dirigible sheds at New Orleans looked like after the recent storm.



### Pan-American Flying Contest To Be Held

At a luncheon given by the Automobile Club of America, in New York City, in honor of Santos-Dumont, the Brazilian aviator, announcement was made that the committee being formed to take up the matter of establishing aviation in Central and South American Republics, hopes to be able to hold a great Pan-American flying contest this year or next year.

Alan R. Hawley, President of the Aero Club of America, and Henry Woodhouse, Governor of the Aero Club of America, made addresses, in which the purposes of the Committee for the development of aviation in South America were outlined.

Mr. Hawley also referred to the work that the Aero Club is doing here in the United States. He told of the determination of the club to establish an aerodrome at Sheepshead Bay Speedway, where, beginning next spring, there will be flying every Saturday. Thus far the Aero Club has succeeded in having the National Guard of seventeen states take up aviation.

Santos-Dumont, who will head the committee for the introduction of aeronautics in all of the Americas, did not make an address on this occasion. His selection to head the committee logically comes from his peculiar fitness for the work. First, as has been recorded, he is a Brazilian. Then he was the first man to give a public exhibition with an aeroplane. His work with dirigibles is notable. He constructed nine airships of this type, and was the first man to fly around the Eiffel Tower. The prize of 20,000 francs, offered for that achievement, he gave to the poor of Paris. For twelve years Santos-Dumont spent \$50,000 a year for the development of aeronautics.

### Acknowledgment

In our issue of September 27th, we presented an article, "The Efficiency of Aeroplanes," by W. R. D. Shaw. Inadvertently we omitted mention of the fact that this article was reproduced from *Aeronautics* (London), a journal devoted to the technique and industry of aeronautics.

### Carranza To Purchase Aeroplanes

Thomas J. Dean, chief aviator of the Carranza Army, arrived in New York by the Ward liner *Morro Castle*. He is here to purchase aeroplanes for Carranza.

### Aviator James Bach a Prisoner of War

James Bach, formerly of New York but now an aviator in the French flying corps, has been taken a prisoner by the Germans according to a report made by Bert Hall of the same squadron, though his capture has not been confirmed by the French War Office. Mr. Hall says that Bach was flying in a Nieuport speed biplane over enemy territory when his motor failed, forcing him to land back of the German lines.



Mr. Chance M. Vought, the noted authority on Aeronautic Engineering, is now with the Curtiss Aeroplane Company as Consulting Engineer, assisting in the development of some mammoth new types of naval hydroaeroplanes for the British Government.

### Miss Ruth Law at the Louisiana State Fair

Miss Ruth Law made flights at the Louisiana State Fair held in Shreveport in October.

### "Man Without Nerves"

Dr. L. M. Young, a surgeon and physician who examined Art Smith at San Francisco, said of him: "Fear is not telegraphed to his brain as in the bodies of other men, and he is a man without nerves." Those who have seen his exhibitions concur in the opinion of the physician.

### A 300-H.P. Lancia Motor

Mr. Arthur Lancia, of the Lancia automobile firm of Turin, Italy, who is in New York buying aeronautical supplies, announces the perfection of a new 300 H.P. motor.

### De Lloyd Thompson at the St. Louis Fair

De Lloyd Thompson, of Chicago, gave daily exhibitions at the St. Louis Agricultural Fair, St. Louis, Mo., early in the month.

From left to right: E. Barton Hall, Lieut. Wm. McIlvain and Edward Britt. Mr. Hall and Mr. Britt are pupils of Lieut. McIlvain, and they have shown remarkable aptitude for the work of piloting the Curtiss flying boat. Mr. Hall is affiliated with the Curtiss Co., and Mr. Britt is a sportsman contemplating the purchase of a flying boat for pleasure.





## CURTISS FLYING BOAT TO BE PRESENTED TO NAVAL MILITIA

The Naval Militia of the State of New York will enter upon a new epoch in its history this afternoon, Monday, November 1st, when Mr. Henry A. Wise Wood, on behalf of the Aero Club of America, will present to Commander Charles L. Poor the first unit in its aerial equipment, a gift from Mr. Glenn H. Curtiss.

It is fitting that the event should be signally commemorated, and with this end in view Commander Poor has arranged a most interesting program for the christening ceremony.

Miss Olive Whitman, daughter of Governor and Mrs. Whitman, will be the sponsor. In this connection it is interesting to note that Mrs. Whitman is the first wife of a Governor to have made a flight in an aeroplane, and with her pretty little daughter will be the honor of being the first to christen a State-owned flying boat.

Amongst those who will be present at the function, which will be carried through at the U.S.S. Granite State, Hudson River and 96th street, at 2:30 this afternoon, will be Mayor and Mrs. Mitchel, Major General Leonard Wood, Captain

Mark L. Bristol, Director of Naval Aeronautics, General Dyer, General Eddy, Adjutant General Statesbury, Major General O'Ryan, Commodore Foresheew and Admiral Usher.

Mr. Alan R. Hawley, President of the Aero Club of America, Mr. Henry A. Wise Wood, Vice-President, and Henry Woodhouse, will represent the Aero Club of America.

It is expected that a number of sportsmen will travel to the christening function in their flying boats and hydro-aeroplanes. Amongst them will be Vincent Astor, Harry Payne Whitney, Robert Glendinning, Clarke Thomson, Gerald Hanley, Beryl H. Kendrick, F. K. Jacquith, and Truman H. Post.

Briefly, the program of the afternoon:

At 12:30 luncheon will be served on the Granite State; at 2:15 o'clock Governor Whitman will arrive; he will be met by a battalion of militia and the gubernatorial salute fired from the Wasp; 2:30, the Governor will deliver a short address; Mr. Henry A. Wise Wood will present the flying boat and Commander Poor will accept it on behalf of the Militia; Miss Olive Whitman will christen the boat; then Ensign Lee H. Harris will take the craft for a short flight.



The Flying Boat presented by Mr. Glenn H. Curtiss to the Naval Militia of New York. Insert, Ensign Lee H. Harris in charge of the first aviation squadron.

## HYDROAEROPLANE AND SUBMARINES PLAY GAME OF WAR

A suggestion of the part that aeroplanes and hydroaeroplanes will be called upon to take in the protection of the nation is found in maneuvers participated in off New London, Conn., by Vincent Astor's hydroaeroplane on the one side and two submarines on the other. The little incident of two hours' duration pretty clearly illustrates the great need of aeroplanes for our national defenses to checkmate the submarines of an enemy. Without submarines the nation is as a man disarmed but without aeroplanes the nation is like a man of great strength but whose eyes are so weakened that he cannot see far enough to protect himself.

Mr. Astor's steam yacht Noma dropped anchor off New London close to the anchorage of the United States Cruiser Columbia, the flagship of a submarine flotilla of seven that has recently assembled there, the new base selected by Secretary Daniels.

On the following day two submersibles—D-1 and G-1—were ordered off Bartlett's reef, ten miles from the city, for deep water diving tests. The programme was, however, abandoned because of a heavy fog. Instead of the tests as originally planned, several plunges were made off the mouth of the harbor, and it was here that both the naval officers and Mr. Astor had an opportunity to participate in a little practice in the tactics that must henceforth be a part of our defensive training.

A game of hide and seek followed. The hydroaeroplane would stand off at some distance after one of the submarines

had dived and await its reappearance on the surface. As soon as it showed its conning tower the hydroaeroplane would dart toward it at top speed, just as would an enemy craft of the air seeking to get within gunshot of the under-sea craft.

At the sight of the aircraft the crew of the submarine would seek to flood their boat and get out of sight and out of danger before the speedy hydroaeroplane got within gun range. This both submersibles accomplished in every instance excepting one, when Mr. Astor came alongside the



The Burgess-Dunne Aeroyacht in which Vincent Astor chased Submarines in War Game



# THE PROBLEM OF A SUITABLE BRAKE FOR AN AEROPLANE

By PORTER HARTWELL ADAMS

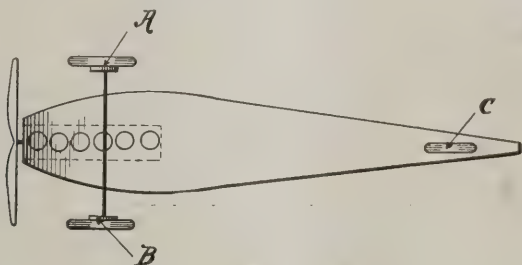
Several years ago when I attended my first aeroplane meet one of the things which surprised me the most was the apparent awkwardness of the machines in landing and the difficulty of controlling them when running on the ground. Accidents, more or less serious, from this cause were numerous, but because of other problems of far greater importance in aeroplane development this matter was neglected by constructors, and it was not until this winter that the importance of the thing was brought to me by the statement of a famous pilot that a suitable brake for use on the ground would be one of the greatest possible improvements in aeroplane construction.

From that time on I gave the matter a good deal of thought and I realized at the outset that four things were absolutely necessary to a satisfactory solution of the problem.

1. Light Weight.
2. Simplicity.
3. Absolute Reliability.
4. Great braking power with as little strain on the chassis as possible and a minimum tendency to pitch the machine on its nose.

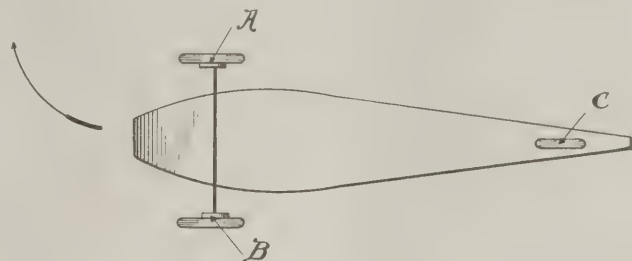
With these requirements in mind I approached the problem and found through extensive experiments that a brake somewhat similar to the brakes used in standard automobile and motorcycle practice was the best suited to the purpose. Brakes of this type adapted to aeroplane use are absolutely reliable, and can be installed on a machine with a total weight of less than nine and three-quarters pounds.

One of the great advantages of these brakes I found is that in addition to stopping a machine, in a straight direction, they can be used very efficiently in steering, and in fact, properly used, will give the pilot complete control of his machine on the ground. The method of using these brakes for steering is shown below.



On a standard landing chassis the brakes are fitted to the wheels at "A," "B" and "C" are operated by a piano wire control either to pedals or to two grips similar to the grips used for lifting the valves in the old days of hard-starting motorcycles.

To steer the machine the grip controlling the brake "A"



is pressed harder than the one at "B," thus turning the machine about its axis or vice versa.

To stop, both "A" and "B" are applied and after they have been applied a certain distance they automatically apply the brake at "C," which helps to stop the machine in a straight direction, and does away with a large part of the danger of the machine nosing over.

The brakes are very simple and wonderfully efficient. At first care is necessary in using them because of their very efficiency, but from my own experiments I found the brakes in every case satisfactory.

Personally, I believe that sooner or later differently designed landing chassis, probably of the four-wheel type, will be found more satisfactory and to allow more efficient use of brakes, but even with the type of landing chassis now in use, brakes will prove adaptable and will greatly increase the usefulness and range of service of the machine.

For example, it is possible for the pilot to apply the brakes, start the motor, remount the machine, release the brakes and with the motor throttled down steer the machine in any direction by use of the brakes alone, stopping and starting at will, without stopping the motor. In landing, a machine may be stopped in a very short distance across the field directly into the hangar if desired.

As a result of my experiments along this line, I was greatly surprised to find what great convenience and important results could be secured by very simple methods, and I believe study in this direction by constructors will repay them greatly for their trouble.

D boat getting within a couple of hundred yards of her before she could seek the protection of the deep.

In actual warfare an attacking aeroplane would have been equipped with guns and bombs of a power to give its crew a very fair chance of disabling or sinking the submarine, so in the game of war played off New London Mr. Astor was credited with sinking one submarine.

In his flights Mr. Astor was accompanied by Commander Yates Sterling of the Columbia.

Clearly the incident indicates not only the great need of airships to protect our great coast line, East, West and South, but it proclaims even more than that the need first of aviators and then of aviators so trained in conjunction with the officers of the navy that the work of an amateur, however efficient he may be as an airman in civilian life, may be supplanted by that high efficiency, resulting from constant study with the accumulated experience and knowledge of the navy as a base of operations.

After the manner of a sailor, a member of the crew of the D-4 described the encounter:

"We knew in my D boat that Mr. Astor was running a mighty nifty craft, a new sort of catamaran, a hydroaeroplane if you want to call it that, or a power boat good for thirty-five knots an hour, and that he and Capt. Sterling were under special orders to catch us if they could and drop us by ramming or by shell down to Davy Jones—all by the theory of the game, just surprising us and getting close enough to shoot or ram if a fight was on and not war play.

"The D-4 (and she's some boat) snooped around, taking a look through the ceiling now and then, but finally we had to rise to the surface to charge batteries. We hadn't any more than come up to daylight when the navigating officer sighted Mr. Astor's submarine chaser. It was a long way off, but it was coming faster than a wild duck, with water shooting up stiff and white as the bow cut ahead.

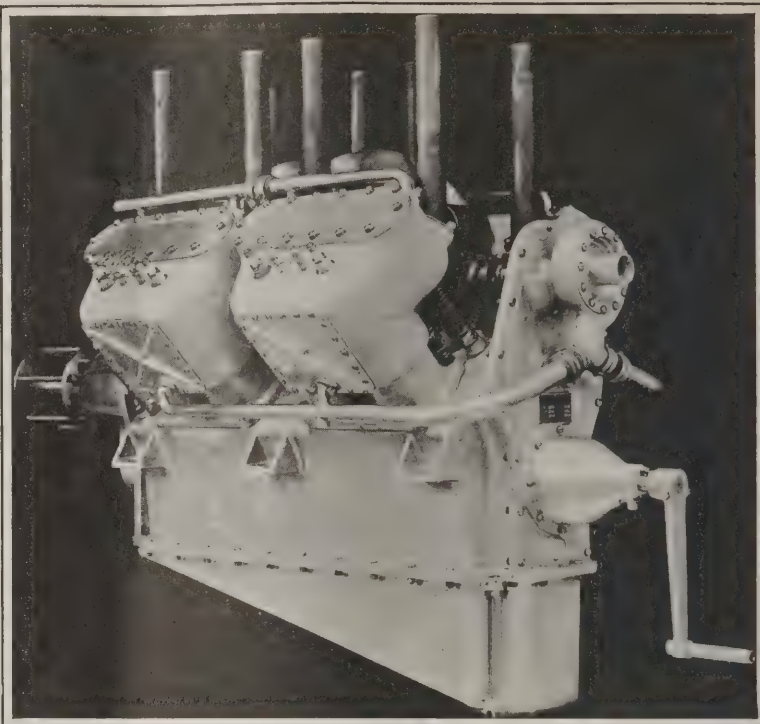
"We tried to duck, you bet! But you can't submerge all at once, you understand. It takes a little time; not much, but a few minutes; and there wasn't time enough to be swiped from the clock just then. Zip-bang! bang! and up came the misses' size destroyer, right alongside, with her one pounder trained square on the periscope and Capt. Yates Stirling squinting over the sights and laughing to beat the band.

"Of course we were out of the game. The skipper and the navigating officer lost their appetite for supper, but they knew they were caught and ran up the signal. One shot in real sea fighting would have sent the D-4 to the bottom with a big hole through her skin.

"Mr. Astor, Capt. Stirling and the mechanic in the hydroaeroplane shot away from us and hunted for the G boat, but the G people were too foxy. They must have taken a peek or two while the enemy was putting us out of business and so beat it while the beating was good. Anyway they escaped and got back to the submarine base here. And believe me," said the submarine man, "if the British are using little speed boats with as much go in them as Astor's, I don't see where the Germans are going to get off."



## THE NEW 8-CYLINDER 135 H. P. THOMAS AEROMOTOR



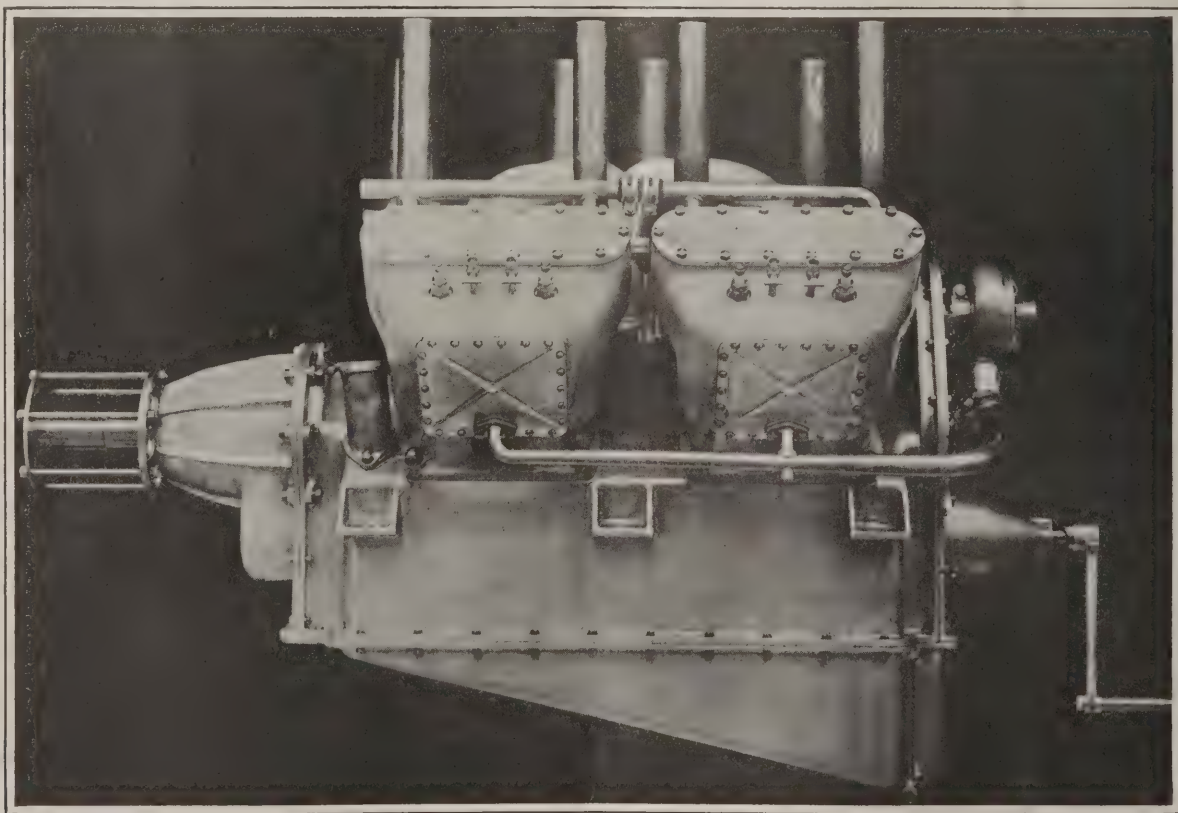
THE initial effort of the Thomas Aeromotor Company, Inc., Ithaca, New York, has been undergoing extensive preliminary tests covering a period of over two weeks. During this time runs of from two to over four continuous hours have been made at full throttle showing a maximum of slightly over 150 h.p. As it has been conclusively proven that it is practically impossible to get either reliability or durability in an aeroplane motor run at its maximum power continuously, it has been decided to change the rating of the Thomas motor from 150 h.p. to 135 h.p. at 2,000 r.p.m. This has been effected by making a carbureter change that will hold the motor down to the latter rating, obtaining at the same time increased fuel economy.

It is quite remarkable that at no time during these preliminary trials has the motor stopped due to mechanical, electrical or carbureter trouble. The Thomas motor bids fair to make for itself a name on the score of reliability—

the crying need of all aeroplane manufacturers to-day. Within a week two Thomas tractors specially designed to take the new motor will be ready and exhaustive air trials will be begun.

**CYLINDERS**—The cylinders are of L head type, cast in pairs, of a special, hard, close-grained iron, showing a tensile strength between 36,000 and 38,000 lbs. per sq. in. A  $\frac{1}{8}$ -inch water space surrounds the cylinder barrels with allowance for plenty of water space about the valve seats. The valve caps are water-cooled, access being had to them by an easily removable aluminum top cover plate. A large opening in the back of each cylinder casting is also covered by a light aluminum plate. These large openings provide facilities for accurate core setting and offer a ready means of cleaning out any core sand. The cylinder head is strongly ribbed. The spark plug bosses located in the center of the cylinder head are water-cooled. Water outlet is arranged over each exhaust valve. The cylinder feet are of ample proportions with holding down bolts close to cylinder barrel.

**VALVES AND VALVE MECHANISM**—Valves are of Tungsten steel,  $\frac{2}{16}$  inches clear opening, and have  $\frac{7}{16}$ -inch lift. Valve springs





are of vanadium steel alloy to insure continuous service at high speed. Push rod guides are held in the cylinder foot. The push rods of square section are made of hardened tool steel, and operated directly by the cams without intervening cam rockers, making a light, durable and simple valve operating mechanism.

**CAMSHAFT**—A three-bearing camshaft of rigid construction with short spans between special phosphor bronze bearings, is located between the two banks of cylinders in the crankcase, and operates all valves from integral cams, hardened and ground to size. The bearings are lubricated by force feed from the main oil duct.

**TIMING GEARS**—The timing gears are made of chrome nickel gear steel, heat treated. The camshaft gear is bolted to the flanged end of the camshaft. Lubrication is taken care of by the pressure overflow from the relief valve in the main oil duct.

**CRANKSHAFT**—The three-bearing crankshaft is made of special chrome nickel steel, showing an elastic limit after heat treatment of 110,000 lbs. per square inch. Journals and crankpins are of generous diameter, drilled for lightness and plugged for the force feed lubrication system. The crank webs are also drilled and plugged to lead the oil to the connecting rod big ends.

**CONNECTING RODS**—Connecting rods are made from a special chrome nickel steel, having a very high elastic limit, and show after heat treatment a tensile strength of 260,000 lbs. per square inch. They are machined all over, securing exceptionally light weight and uniform balance. The big ends are babbitt lined integrally with the rods by a special process, then reamed and scraped to a perfect fit. The wrist pin bushings are made of "non-gran" bronze pressed into the connecting rod and reamed to size. The two banks of cylinders are staggered, permitting side by side connecting rods on the crankpin.

**PISTONS**—For those desiring the 2,000 r.p.m. motor, the pistons are of cast iron of exceptionally light weight. The head is well ribbed for strength and cooling and is supported from the piston bosses. The skirt is drilled to secure added lightness. The concentric lap jointed compression ring is used. The piston pin is made of chrome nickel steel, drilled hollow, pack-hardened and ground to size. A taper lock screw is used to secure the pin in the piston. For those desiring a higher engine speed and power, special aluminum alloy pistons are fitted, permitting an increase to 2,500 r.p.m.

**CRANKCASE**—The crankcase is a "Lynite" aluminum casting of deep-sided section, well ribbed for strength and rigidity. The lower half of the crankcase serves only as an oil reservoir or sump and is bolted directly to the upper half.

**CARBURETER**—A 2-inch double barreled Zenith carbureter is bolted to a cast aluminum double branch manifold, serving the two banks of cylinders. All manifold bends are of large radii.

**OILING SYSTEM**—Oil is forced under high pressure to all bearings. A gear oil pump, driven from the crankshaft timing gear, delivers oil to a main oil duct within the crankcase. Drilled holes in the main bearing-supporting webs deliver oil from this oil duct directly to the crankshaft and camshaft journals. The connecting rod big ends are to receive oil through the drilled crank-

#### THOMAS AEROMOTOR—MODEL 8.

Type .....	High Speed 8 cylinder "V" motor, 4 cycle.
Bore .....	4 inches.
Stroke .....	5½ inches.
Rated Horse Power .....	135.
Brake Horse Power .....	(at 2,000 r.p.m.) 135.
Motor, r.p.m. ....	2,000 to 2,500.
Propeller, r.p.m. ....	Any desired speed from 1,000 to 1,500.
Oiling .....	Force feed to all bearings. Sufficient oil carried in sump for five hour flight.
Cooling .....	Water.
Carburetor .....	2 inch, double barrel Zenith.
Ignition .....	Splitdorf "Dixie 8," driven at crankshaft speed.
Self starter .....	Christenson gasoline air starter.
Gasoline Consumption .....	14 gals. per hour.
Oil Consumption .....	1 gal. per hour.
Weight .....	Complete with carburetor, magneto, starting crank, propeller bolts, and front plate, but without propeller and radiator—550 lbs.

shaft webs and crankpins. The pistons are lubricated by the oil thrown off the crankpins.

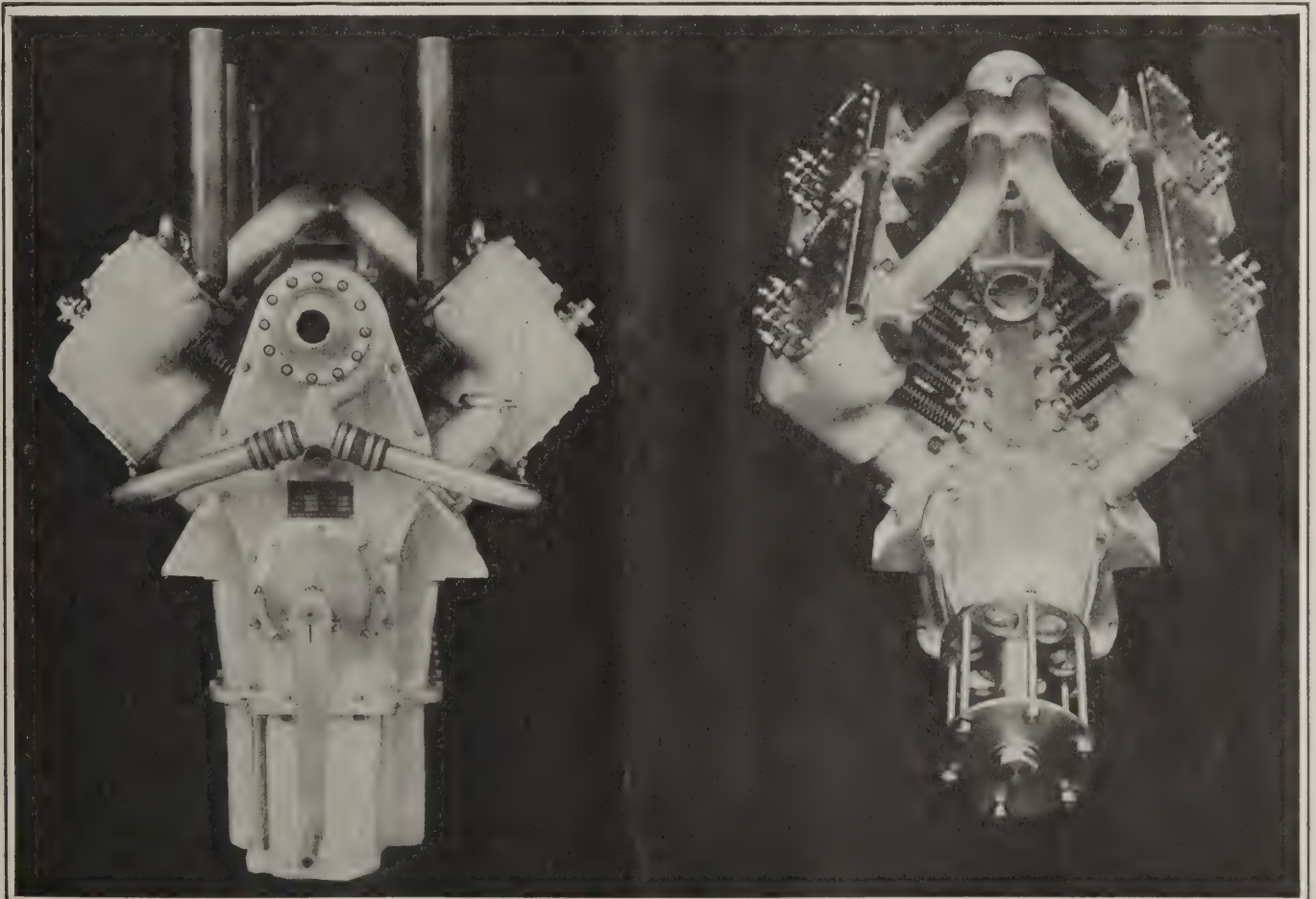
**WATER COOLING SYSTEM**—A single centrifugal water pump, driven through gearing from the camshaft timing gear, serves both banks of cylinders. A siamese outlet from the pump insures an equal distribution of water to the brass water pipes leading to the cylinders. Water outlet connections are arranged over each exhaust valve. Only four hose connections are necessary with each motor.

**MAGNETO**—A crankshaft speed Splitdorf magneto with double distributor is used. It is driven through gearing from the camshaft timing gear by the same shaft that operates the water pump.

**PROPELLER SHAFT**—The propeller shaft is driven from the crankshaft through spur gears of chrome nickel gear steel, heat treated. It is carried on two large annular ball bearings, housed in an aluminum gear case bolted to the crankcase. One of these ball bearings is of the double row type and takes care of the propeller and thrust. By selecting the proper reducing gear ratio any propeller speed from 1,000 to 1,500 r.p.m. may be obtained with crankshaft speed at 2,000 r.p.m.

**SELF STARTER**—The very satisfactory Christensen combined gasoline and air pressure starter is used. It is driven directly off the rear end of the crankshaft in place of the starting crank.

The manufacture of this motor in quantities will be begun at once by the Thomas Aeromotor Company.





# THE RIGID DYNAMICS OF CIRCLING FLIGHT

The Third Wilbur Wright Memorial Lecture Delivered  
before The Aeronautical Society of Great Britain.

By Prof. G. H. Bryan, Sc. D., F. R. S.

(Concluded from last week.)

## PROBLEMS—(Continued)

I do not wish it to be thought that I am neglecting the work done by the Wright Brothers, from a quasi-engineering point of view, as pioneers and constructors and designers of their own machines, either full scale gliders or as finally represented in their completed aeroplane; in this work alone there is evidence not only of real knowledge but also of great skill and daring, attributes which are nearly always to be found in combination where success in any new problem is achieved. To be just to the Wright Brothers, however, and to be fair both to those who preceded and followed them, and to those whose achievement in the same field of work was independent of their own, it is necessary to appreciate that the great achievement of the Wrights must be regarded as centred in actual performance.

The problem of flight was simplified by the Brothers Wright into finding a solution to the aerodynamic side of the problem. There were others who talked of stability and who studied stability and believed some kind of inherent or automatic stability was necessary. The Brothers Wright had the acumen to perceive that to attempt too much was to court failure, and, following to some extent the teaching of Lilienthal, determined to treat this side of the problem as an affair of the art of flight and so simplify the issue and concentrate on the really essential, the problems of sustentation, motive power, and propulsion, for the solution of which the material was already almost within reach.

Thus, in the early Wright machine there was neither longitudinal nor lateral stability, but the whole machine was worked out to be as completely under the control—positive control—of the aeronaut as possible, and though in the course of their experiments I understand that the Brothers Wright made several trials of varying the load distribution and flight organs to obtain stability, their conclusion in this direction was that in the then state of the art the purely hand controlled machine was the best. It is thus that the *Art of Flight* became so important and distinctive a feature of the Wrights' work.

I had many opportunities of seeing Wilbur Wright and talking with him at the time when he was demonstrating his machine in France in 1908, and then formed the opinion that the characteristic in which Wilbur Wright excelled was in skill in the art of flying. One has only to recall his performances in France to see how much superior he was to the other fliers at that time. When Farman was flying cautiously round in circles of large radius, Wilbur Wright, by virtue of his combined rudder and warping control, was able to turn and twist in the air in curves of very small radius, in brief, his flying was like that of a bird.

I always found Wilbur Wright commendably careful of the reputation of flying from the public standpoint; he had a great sense of his personal responsibility. The War Office, has kindly consented to give you further information, and I take advantage of this occasion to assure him how greatly this Society, and I am sure all here, have appreciated the bravery, skill and devotion shown by the Flying Corps of both Services. Nothing could have been finer, nothing more useful to the country in the present crisis.

Colonel W. S. BRANCKER (Deputy Director of Military Aeronautics): I rise to second Major-General Ruck's proposal of a vote of thanks to our Chairman, and I take this opportunity of making a few brief remarks to show of what great value mathematics and scientific research has been to the Royal Flying Corps.

The present war has probably fulfilled some of Wilbur Wright's wildest dreams; and I think that the work of the Flying Corps has gone to prove that we as a nation have nothing to reproach ourselves with in the use we have made of Wilbur Wright's wonderful heritage.

We took the field with many different types of aeroplanes. Two months of war proved that the aero-dynamical qualities and the construction of the British types were undoubtedly superior to both those of our Allies and our enemies. This fact, backed by the incomparable courage of our pilots, enabled us to establish

a virtual command of the air in the zone occupied by the British Army. Every German pilot who made his appearance was attacked, and it became an invariable rule that no German would face a British aeroplane. Lately, however, the German aeroplanes have greatly improved in their speed and climb, I think probably owing to the introduction of a more powerful and more efficient engine. At the moment, there are German aeroplanes which can out-pace all but our fastest machines, with the result that the hostile pilots have become bolder in the aerial combat and now have to be driven off instead of hunted. The Germans have given up reconnaissance over our lines to a great extent because we have given them such a bad time, but they have lately devoted themselves to attacking our aeroplanes while they are observing artillery or making a reconnaissance. It has consequently become almost a normal custom to send up two aeroplanes together, one to do the reconnaissance and the other the fighting.

The reason for this German advance is not our neglect of the science of aerodynamics; it is the outcome of the fact that at the outbreak of war the aeronautical engine trade in England was practically undeveloped, and up till quite lately we had depended very largely on comparatively low-powered French engines. Already, however, higher powered British-made engines have made their appearance at the front and the pendulum is swinging back again; British design backed by sufficient horse-power is once more proving its superiority, and we have given the Germans some very ugly surprises lately.

Many points of aerodynamical interest have been brought out by the war of which I cannot speak now; the most interesting is, perhaps, the conflict between the necessity of carrying weight and the desirability of a rapid climb. The development of fighting in the air makes great demands in weight carrying qualities; practically every machine which takes the air now is equipped with some form of offensive firearm, or with bombs, over and beyond the endless accessories such as field-glasses, cameras, wireless instruments, etc.; and naturally the "pusher" type, which was the type that Wilbur Wright evolved, although comparatively slower, has proved its superiority for the use of weapons. Armour is also necessary to ward off the splinters of the anti-aircraft shell. At the same time speed, climb, and easy handling must be retained if the pilot is to have a fair chance of accounting for his enemy.

In spite of the demands of war for standardisation and rapid output, we are still developing and improving the aerodynamical qualities of the British aeroplane; as the war goes on the demands for speed, climb, and lift, will become more and more exacting, and I trust that we shall be able to meet them with the assistance of mathematicians like the lecturer to-night and the scientific research of the National Physical Laboratory. The stable aeroplane, of which I think Colonel Seely spoke to you on this same occasion last year, has become a standard type. This stable aeroplane was, I believe, proved mathematically possible in the first instance by Professor Bryan, whom we have heard lecture to-night; the model researches were carried out by the National Physical Laboratory; the full-size experiments and the first machine was made by the Royal Aircraft Factory; and it was first flown without controls by my departed friend, Mr. Busk, who was then in charge of the physical research and test work at the factory. A very efficient combination.

Stability has proved of very great value in war; the pilot, flying by himself, can use his hands freely for weapons of offence and defence and can even kneel on his seat and look over his tail during a reconnaissance. It is also the only type of machine on which a hastily trained pilot can be depended on to fly efficiently. We have to train pilots rapidly now, and the stable machine is an absolute godsend.

I think that we can say that Wilbur Wright and his genius have stood us in good stead in this great crisis. Personally, I trust that the next anniversary of this occasion we may be discussing the wonderful uses of aviation as a peaceful pursuit and not as a weapon of war.

## Darwin R. James Cries "Flying Beats Motoring!"

Darwin R. James, of Brooklyn, President of the Pyrene Manufacturing Co., visited the Garden City Aviation field just as Harold Kantner, the aviator, was trying out a new machine of his own design, and the noted manufacturer accepted an invitation to fly. Mr. James soared away until the plane looked like a dove in the sky. Like most persons who make their first flight, he returned to earth, delighted with the experience and surprised to find that instead of being an ordeal the journey away from earth did not even make him nervous.

"It was such a pleasing experience that I was thoroughly delighted," Mr. James is quoted as saying. "Automobile riding isn't in it with flying. If the price of airships ever comes down, so that they will be within the reach of men of average means, I shall buy one."

"There wasn't anything unpleasant about it—no bumps, no jolting, no sea-sickness. We just floated along as nicely as you please. It was hard to gauge the speed, but I knew by the way we passed the fast cars on the motor parkway below that we were going very fast, and when the aviator told me that we had traveled along at a clip of seventy-five miles an hour, I was surprised."

"The view was beautiful. The stream of automobiles resembled moving ants down there on the speedway, and seemed to be crawling, although I understand that some of

them were spinning along at sixty miles an hour. No, I did not get nervous, for there was nothing to get nervous about. When we volplaned down the motion was a gentle one. I cannot describe how absolutely delightful a sensation it was."

## Sturtevant News

An order for two 140 h.p. eight-cylinder aeronautical motors to be used for training purposes in connection with the National Defense Movement has been placed with the B. F. Sturtevant Co., of Hyde Park, Mass. These engines, which are of four-cycle, water-cooled "V" type, will go in military aeroplanes constructed by the Burgess Company, of Marblehead, and upon completion will be shipped to the U. S. Naval Aeronautic Station at Pensacola, Fla.

The Sturtevant Company have reason to be proud of the castings which enter into the construction of their aeronautical motors. An expert aeronautical motor designer and engineer during a recent tour of inspection through the Sturtevant plant declared that the cylinder and base castings of the 140 h.p. motor were the most perfect and beautiful that he had ever seen during his travels, both here and abroad. These castings are all made at the works.

A communication was recently received from Major Hume, of the English R. F. C., recommending highly the Sturtevant "eight" 140 h.p. motor.





# FOREIGN NEWS



## ARGENTINA.

Joaquin Oytaben, director of the aviation school connected with the marine arsenal at La Plata, was killed October 16 while making a flight in his aeroplane as a result of an accident to the machine.

## CANADA.

The Canadian Aviation Schools Fund, of which the Duke of Connaught is patron, and which Major A. Ross Hume, Royal British Flying Corps, is advising, are going ahead with plans to establish aviation schools at Halifax, Winnipeg and Vancouver, to supply the clamant needs of the British forces. Toward the expenses Col. Merritt has offered Winnipeg and Vancouver \$10,000 each on like amounts being raised locally.

## FRANCE.

During the night of October 16th French aviators bombarded the German army provision post of Maizieres d'Azoudange and the railroad station of Avricourt. The Germans having again recently carried out aerial bombardments against English towns, and one of their aeroplanes having dropped two bombs on Nancy, a group of our aeroplanes bombarded the town of Treves (Rhenish Prussia), on which thirty shells were dropped.

According to an official Belgian report French aviators bombarded the German aviation field at Burlioncourt, northeast of Chateau-Salins (in German Lorraine) on October 18th. Several of the German hangars were demolished.

The Military Inventions Commission has bought from a French engineer the patent of a mitrailleuse for aeroplane use which weighs fifteen pounds and can be operated by an aeroplane pilot without endangering the balance of the aeroplane. Tests were made at one of the aviation centers near Paris, and one of the factories manufacturing mitrailleuses for the French Government will hereafter devote its capacity exclusively to the new model. The model formerly used on aeroplanes weighed fifty-five pounds, and could not be easily operated by the pilot. The redoubtable Pegoud was in fact one of the few pilots who did successfully manage both his aeroplane and his mitrailleuse. The new gun does not differ materially from the old one as regards range and accuracy, but it requires a superior system of bracing to make up for the increased shock of the kick, due to the smaller weight of the gun itself.

## GERMANY.

According to Berlin newspapers, the Russian schooner *Ila*, with a cargo of coal and iron, has been sunk in the Gulf of Riga by a German seaplane. The account states that the crew was saved.

German authorities in Belgium have announced, says the *Echo de Belge*, that on the occasion of any Anglo-French aeroplane raids on Belgian cities under German occupation the inhabitants of the city will be held responsible. If bombs fall on the barracks the soldiers, according to the announcement, will be billeted in civilian homes, and a fine corresponding to the damage will be imposed upon the city. Advice from Paris last July said the German officials in Belgium had imposed a fine of \$1,000,000 on the City of Brussels in consequence of the destruction of a Zeppelin dirigible balloon in sheds at Evere, to the north of Brussels, by aviators of the Allies.

Zeppelins are being used by Germany for the defense of commerce against attacks by British and Russian submarines, according to a despatch from Berlin. It is stated that the steamer *Scotia*, of Stettin, Prussia, bound from Sweden to Stettin with a cargo of ore, was pursued by a British submarine off Bornholm. In reply to wireless calls for assistance a Zeppelin suddenly appeared, whereupon the submarine submerged and disappeared.

According to a report from Maubeuge, France, a Zeppelin was destroyed on October 18th by dashing into the chimney of a glass works. All the occupants were killed.

Attacks by aeroplanes upon German cities near the battlefronts especially on the west have created a demand for insurance against injuries from bombs thrown upon them, says Leo A. Berghoff, United States Consul General at Dresden, Saxony, in a recent issue of the *Commerce Reports*. The Stuttgart-Berliner Insurance Company has in consequence established a department of what may properly be called aerial insurance, the company issuing policies covering damage to all property, real or movable, caused by explosive bodies or other objects thrown or falling from flying machines or caused by airships or aeroplanes themselves in making a voluntary or involuntary landing, or by parts thereof falling from them. The policies make no provisions for injury to or loss of life. Details of the insurance or the rate of premiums have as yet not been published.

## GREAT BRITAIN.

C. G. Grey, an aviation expert and editor of *The Aeroplane*, writes in the *Daily Express* that the whole scheme of defense against Zeppelins is wrong and that the most practical method of defense against the aircraft is to blind their operators with the glare of searchlights.

Mr. Grey says: "The proposed plan of sending up aeroplanes at night to attack Zeppelins is ridiculous, because until the Zeppelin is lit up by searchlights the aeroplane cannot find it, and then as soon as the aeroplane rises above the Zeppelin to drop bombs it gets into the beam of the searchlight and the pilot is made helpless by the glare. One hears much about night aeroplane patrols over Paris, but they are there chiefly to compose the minds of the people, and the real protection of Paris is a ring of searchlights completely enclosing the city. I submit the following scheme for the protection of London. Divide the city into half mile squares and in the corners of each square place searchlights throwing wide beams vertically upward, the beam of each searchlight overlapping that of its neighbor. Thus London would be covered with a carpet of light so blinding that passing aircraft could see nothing below, while land guns would have a clear target in the lighted area above."

Speaking for the government in the House of Lords, the Duke of

Devonshire, Civil Lord of the Admiralty, said the Admiralty, which was responsible for the air defense of London, was doing all possible adequately to meet the Zeppelin menace, and although the problem was not an easy one, it hoped to be able to make the defense of London satisfactory in the future. The Duke said there was no evidence that any Zeppelin dirigible balloon had been brought down by gun fire either on the latest or the previous raid. The Earl of Portsmouth suggested the people of London should be advised of the approach of Zeppelins, but the Duke of Devonshire thought that such a notice would cause greater panic.

A casualty list cabled to the Canadian Government demonstrates that the Zeppelins which visited London recently succeeded in locating and dropping shells on the big Canadian training camp at Otterpool, on the Kentish coast. It would seem that eleven Canadian artillerymen lost their lives through the raid.

Read Admiral Vaughan-Lee has been appointed chief of the Royal Naval Air Service, a branch of the British Navy, which has been largely increased during the last few months in view of the ever growing importance of the naval aeroplane, particularly in scouting work.

The American liner *St. Paul* arrived October 24th from Liverpool with the first eyewitnesses of the Zeppelin raid over London on October 13th. All accounts agreed that the night was clear, that the Zeppelins could be seen plainly when the searchlights shone on them, and that there was no cloud of steam emitted by the airships to hide them from view. The shells from the anti-aircraft guns fell short of the Zeppelins, it was said, and caused great destruction of property. According to those who timed the visit of the raid it occupied only seven minutes altogether. There were three to five Zeppelins coming from the city from the northeast, but the squadron split up before reaching the outskirts, and the units took different routes afterward. It was the general opinion of those on board the *St. Paul* that between two hundred and three hundred people were killed.

The East Coast Raid Committee, appointed last January, has concluded its investigations of the claims submitted and has presented its final report to the Treasury. The investigations covered the bombardment of Hartlepool, Scarborough and Whitby and the fourteen air raids previous to June 15th. The number of claims for personal injury reported on was 697, of which 178 were fatal cases, while the number of property claims investigated was 10,297.

The Home Office in a statement referring to the German account of the Zeppelin raid on London, declares that it contains numerous statements which are quite untrue. One, to the effect that an anti-aircraft gun has been placed under cover of St. Paul's Cathedral, "can," it is declared, "only be characterized as a falsehood apparently invented to excuse what German aircraft are attempting to do." An official statement issued at Berlin on September 19th, asserted that London was fortified by a great number of permanent fortifications and by a still larger number of field fortifications.

## HOLLAND.

In the Budget recently presented to the Dutch Parliament funds were asked by the Minister of War for the requisite extension of both the *personnel* and *matériel* of the Dutch Flying Corps.

## ITALY

It is reported that all large and highly colored advertisements along the Italian railways are to be removed, because it was found in France and Belgium that similar objects guided enemy airmen.

## JAPAN.

Lieutenant Makoshi, of the Imperial Japanese Navy, recently made a continuous flight of more than ten hours with a Curtiss model "OX" 90 horsepower motor, making a circuit from the naval base at Oppama touching Tokyo and Yokohama and covering more than 500 miles.

The American aviator Holmes is now in Japan, giving numerous exhibitions and flying for the military authorities. He uses a Curtiss type biplane which is equipped with a 50 h.p. Byro motor. He is enthusiastic concerning the service rendered by his motor.



A Swiss military captive balloon anchored to a barge, being towed to a point where the observers who ascend in it can watch and detect trespassing on Swiss soil by belligerents.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1363 Townsend Avenue, Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 130, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**HARLEM MODEL AERO CLUB**  
73 West 106th Street, New York City  
**MILWAUKEE MODEL AERO CLUB**  
402 Bradford Avenue, Milwaukee, Wis.  
**CONCORD MODEL CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**AERO CLUB OF ST. LOUIS**  
Columbia Bldg., 8th and Locust Streets, St. Louis, Mo.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### National Model Aeroplane Competition—R. O. G. Contest

The third of a series of model aeroplane contests for the Aero Club of America's cash prizes and the Henry S. Villard Silver Trophy took place at the Rugby Flying Field, 95th St. and Church Ave., Brooklyn, Sunday afternoon. The contestants were:

The Summit, N. J., Model Aero Club, represented by Wallace A. Lauder, holder of the world's record for hand-launched models, Curtis Meyer and John Barker.

The Aero Science Club of America, represented by E. P. Lott, A. K. Barker, Frank Broomfield and C. W. Myers.

The Bay Ridge Model Aero Club, represented by J. L. Bamberger, H. Rohnfeld, Ralph Olsen and Wm. Bamberger.

Wallace A. Lauder carried off the individual honors, making one flight of 91 3-5 seconds, and the club of which he is president averaged the highest, but the most consistent flying was done by E. P. Lott's model in three flights of 35, 38 1-5 and 46 1-5 seconds duration.

All the models except that of Louis Bamberger were of the pusher type, and all were equipped with small wheels, on which they ran along the ground for several feet before rising into the air. The motive power was furnished in all cases by tightly-wound rubber bands, and the stability displayed by the small models weighing not more than four ounces was remarkable, considering the fact that a twelve-mile wind was blowing.

The second best flight was made by Curtis Meyer, also of the Summit Model Aero Club. The model climbed high into the air, circled about half a dozen times, and finally landed safely after, making a flight of 86 4-5 seconds.

The third best flight, one of 64 2-5 seconds, was made by C. W. Myers, of the Aero Science. All of these marks closely approach the world's record for duration, starting from the ground.

This is the third, and for this year the last, of the model aeroplane contests instituted by the Aero Club of America. The National Model Aeroplane Competition, consisting of three monthly contests and which were open to all the Model Aero Clubs in the United States, was instituted to encourage the efforts of thousands of young men all over this country who are beginning their activity in aeronautics by flying and experimenting with aeroplane models. Among these young men there may be geniuses who may evolve new and better types of aircraft, or features which will improve the existing types.

Cash prizes of \$50, \$25 and \$10 are awarded each month to the individual members of the various clubs who make the best records. The Villard Trophy, donated by Mr. Henry S. Villard, will be awarded to the club whose members collectively make the largest score during the three months' contests.

The contestants of the different Model Aero Clubs, and the total results of their flights are as follows:

#### AERO SCIENCE CLUB OF AMERICA:

	Best Flight		Total	Average
E. P. Lott.....	46½	38½	35	119½
A. K. Barker.....	28½	2½	2	32½
Frank Broomfield .....	5	3	2	10
C. W. Myers.....	64½	38	13	115½
Club Total .....				92.66
Average .....				23.16

#### SUMMIT, N. J., MODEL AERO CLUB:

	Best Flight		Total	Average
Wallace A. Lauder....	91½	5½	5½	102½
Curtis Meyer.....	86½	6	2½	95
J. W. Barker.....	63	29½	14½	107½
Club Total .....				111.39
Average .....				27.84

#### BAY RIDGE MODEL AERO CLUB:

	Best Flight		Total	Average
L. J. Bamberger.....	21	6½ (wrecked)	27½	9.06
Ralph Olsen .....	41½	7½ (wrecked)	48½	16.2
H. Rohnfeld .....	41½	34½	30½	106½
Wm. Bamberger .....	31½	4½	3½	39½
Club Total .....				74.12
Average .....				18.53

The judges at this contest were Messrs. Henry Woodhouse, G. Douglas Wardrop and Burt McConnell.

### Aero Science Club of America

At the Rugby Flying Field the Aero Science Club held its R. O. G. contest, the last of the series for the Aero Club of American Prizes and the Villard Trophy. Those who represented the Club were, C. W. Meyers, E. P. Lott, Frank Broomfield and A. K. Barker. The Summit and Bay Ridge branches also competed at the same time. Wallace A. Lauder, of the Summit Club, made the best duration, his model remaining in the air 91 3-5 seconds after rising. Irrespective of the many accidents caused by trees, good flights were made. Louis Bamberger, of the Bay Ridge Club, made some very good flights with his single propeller tractor model, which on one occasion made an official duration of 37 seconds.

At the last meeting a large number of members were present and the compressed air motor was the subject most discussed during the evening. Through the efforts of the club it is hoped that the use of an Armory can be obtained where-in model contests can be held during the winter months. Those now building models for compressed air motors think it will be convenient and advantageous for experiments. For further particulars address the Secretary, 29 West 39th St., New York City.

### Illinois Model Aero Club

By WARD PEASE

The Illinois Model Aero Club held its R. O. G. contest of the National Model Aeroplane Competition, Saturday, October 16th, at Cicero Flying Field. Mr. J. S. Stephens, vice-president of the Aero Club of Illinois, was present as the representative of the Aero Club of America. A moist, chill wind blew in off Lake Michigan from the east and took the "pep" out of the rubber motors on account of the cold and the damp condition of the atmosphere made the paper on the wings flabby and loose which helped to bring our average down to what it was. On account of the strength of the wind, which threatened to blow our models across the field and over the fence, it was necessary to move our rising platform near a row of trees which bordered the field, and the gusts and currents they set up are also responsible for the flights which are so low. A small tree ended one of the flights very abruptly and on another flight the model went out of sight over some houses, and time could be taken only until the model disappeared.

The results of the meet are as follows:

Name	Best flight		Total	Average
Pease .....	129	97	6	232
Cook .....	97	94	14	205
Hall .....	80	47	42	169
Lucas .....	58	50	6	114

Club total, 720 seconds; club average, 60 seconds.

(Continued on page 163)





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Rewarded

"John and James went to the hill to fly their kites. John had a new ball of twine. He gave James ten yards for his kite and kept the remainder of the ball for his own use"—

"I got the answer, teacher," shouted one boy.

"Well, what is it?"

"Johnny got a good mark for being perfect at short division."

There was an old maid in Glengary,  
Who made up her mind she would marry;  
But the men saw her first,  
And at full speed "reversed,"  
Which caused all her plans to miscarry.

First Aviator: No matter how hard I tried I just couldn't get up this morning.

Second Aviator: Too much last night, huh!

First Aviator: No. Engine trouble.

Luke: I hear Jack the aviator had a financial fall.

Duke: He did, hey! What was the trouble?

Luke: Didn't bank enough, so they say.

A good many people are affected in the winter time with what is known as aviator's indigestion—"too much pan-cake."

Wiley: Ma! Why does the aviator sit away out in front there?

Mother: I suppose it's because he wants to keep ahead of his business.

Jack: Did Bill tell you anything about his new flying machine?

Jake: No. What about it?

Jack: Oh, it's too "plane."

Two aviators were sailing through space one day when one seemed to be constantly looking over the side.

What do you see down there? asked the pilot.

I see a long white streak stretching out from the hotel and beyond.

Oh, said the pilot, that's only our hotel bill, beating it on our track.

Bill's getting so high in the world these days that he is beginning to look down on us.

Is that so? said the listener. What's the cause of it all?

Oh, he is one of those air-pilots.

#### Aviation and Poetry

Aviation is an æsthetic calling, although at first sight it may not appear so. Still, there is an aviator at Hendon who can prove that it is, for he is always running two great dangers. He risks his life by flying and his reputation by writing poetry.

"When I fly aloft, soaring high and far,  
And nothing earthly at my nerves can jar,  
The deepest thought that rises from my soul  
Is not how great, but just how small men are!"

This is the last stanza of the "Rubáiyát of the Poet Aviator," by Winchester, the airman, and taken from a recent issue of *Aeronautics*.

#### Not Known

She (reading war news)—Here's news from Russian stating that Pychmsviensk fell yesterday.

He (aviation enthusiast)—Really! Can't say I've ever heard of him. Wonder if he was flying a Sikorsky?

#### R. I. P.

Here lies a fellow

Who had plenty of nerve,

But forgot what to do

When he banked for a curve.

#### Cheered Him Up

After much meditation the wealthy business man thought he would go a-flying. So he approached an aviator at a flying ground and fixed things up.

Up they went, but the machine seemed very unsteady. It wobbled and zigzagged terribly, and once or twice nearly side-slipped.

"Easy there!" gasped the passenger, roaring wildly above the noise of the engine. "Remember this is my first trip."

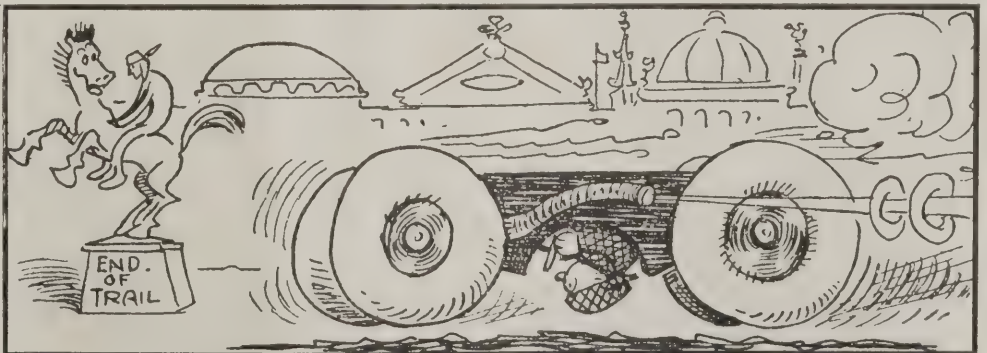
The aviator yelled back at him: "Well, it's only my third."  
—*Pearson's Weekly*.

#### The Repentant Murderer

Extract of a letter from a girl to her friend: " \* \* \* We have had two Zeppelins over here this week, one last night which mother saw going to church, and one on Sunday \* \* \*"—*Punch*.

Advice by the London *Daily Mail*: "If the airship is near or overhead, lie down and get on the lee side of a wall, which will break the blast, should a bomb explode near at hand, placing the wall between yourself and the window or windows." We fear the portable wall will present some difficulties.—*Punch*.

'Tis rumored that one Art Smith has become greatly interested in the auto racing game.—(Courtesy San Francisco Chronicle.)



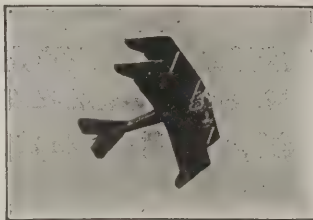


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(Continued from page 150)

of the army and navy are there enough officers. Again Congress is responsible. It will not give the money to educate and pay them. In consequence, with every regiment and every battleship dangerously undermanned in the supply of officers, few can be spared for aviation. It all works in a vicious circle. It is all a part of the crime of unpreparedness. For those few aviators we have there is no word but praise. That we possess so few aircraft, that the twelve we have are out of date, and frequently out of hand, that we have not 500 men, each with a pilot's license, is no fault of those who are aviators. Daily at Vera Cruz I saw them risk their lives in machines that were obsolete. Stolz, whom I knew well and who was as careful an aviator as he was courageous, was killed by his own machine. Killed by an act of Congress."

Get a copy of the *Metropolitan*, read it, then do what Mr. Davis urges, write to your Congressman and ask him what he is planning to do about it.

## Williams Exhibitions in the South

The O. E. Williams Aeroplane Company, of Fenton, Mich., reports an excellent season in exhibition work. The company at present has two machines in the south. Mr. O. E. Williams has filled contracts at Kenneth, Mo., Piggott, Ark., and Walnut Ridge, Ark. The following dates were assigned to Albert Boshek, who is flying the second machine: La-Grange, Ga., Oct. 19-21; Montevallo, Ala., Oct. 27-29; Elberton, Ga., Nov. 2-4.

## Michigan News

By W. S. MARTIN

Detroit now has quite a hydro-aero-haven, there are three flying boats stationed here permanently. Mr. Barton L. Peck, with his Curtiss boat; the Maxi boat, built and owned by the Maximotor Co., and piloted by Eddie Korn, one of the veteran aviators, and a Janus boat, owned by C. Van Housen and W. E. Davidson, of Detroit. On Friday last, Mr. Peck gave his new Curtiss O. X. engine its first aerial try-out, taking W. S. Martin as passenger. The engine worked splendidly and showed an abundance of surplus power.

Shortly after Mr. Peck went out, Mr. Korn started out with the Maxi and both did some very pretty flying the balance of the afternoon. The Maxi is powered with a Maximotor "6" and it proves very efficient, Mr. Korn flying over land for about five miles at an altitude of two thousand feet as a finis for the day's work.

The aviators and enthusiasts are forming an Aero Club here to boost aviation and an all around get together club for those interested in flying.

## Chicago News

By WARD PEASE

Earl Daugherty has just received his new loop the loop tractor biplane from Max Stupar, which is equipped with one of the new Frederickson two-cycle rotary motors.

Miss Katherine Stinson has been flying in various towns in the Middle West and is soon to ship to San Francisco where she has a contract to loop the loop in the near future. Her brother, Eddie Stinson, is now attending the Wright School and he will soon be flying the tractor biplane which is now at Cicero.

E. M. Laird has finished a very successful exhibition season in the Middle West, and when he has flown for his pilot's license he will start work on the Gnome motored tractor in which he will loop the loop next year.

E. L. Partridge, who has been building aeroplanes in Chicago for several years, is now learning to fly one and is getting along nicely.

## Military Aeroplanes

An Explanatory Consideration of their Characteristics, Performances, Construction, Maintenance and Operation, for the Use of Aviators

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**British Order Aeroplane Guns**

The General Ordnance Company, of Derby, Conn., has begun to manufacture an aeroplane gun, for which it has taken a contract from the British government. The United States Government has had an option on this gun for three years, but has rejected all offers to avail itself of it. The gun was invented by Mr. Cleland Davis, commandant of the Naval Radio Station at San Diego, Cal. It has been developed by Mr. Gregory C. Davison, of New London, vice-president of the Electric Boat Company and the General Ordnance Company. In a test held above the Thames River, near the New London Navy Yard, a few days ago, twenty-five shots were fired at a target from an altitude of a mile with twenty-five hits.

(Continued from page 160)

**Y. M. C. A. Model Contest**

At the last meeting of the Contest Committee it was decided to postpone the model contest which was scheduled for November 2nd, Election Day. Many good reasons were offered in favor of postponing the contest until next Spring. In the meantime a class for instruction will be conducted at the Y. M. C. A. for those who desire to study the art of model flying. Just when this class will meet has not yet been definitely decided upon, but will be announced in a later issue. Lectures treating upon the subject of Model Flying and Construction will be given in the Public Schools of the Oranges during the coming months in addition to outdoor demonstrations. Model aeroplanes also will be loaned to the Y. M. C. A. for exhibition purposes during the period of instruction. These models will be loaned by members of the Aero Science Club, which will assist the Y. M. C. A. in every way possible toward a successful conclusion.

Further information regarding the above may be obtained from Mr. H. B. Grant, Secretary, Contest Committee, Y. M. C. A., Orange, N. J.

**Plattsburgh Model Aero Club**

By JAMES F. REGAN, JR.

The Plattsburgh Model Aero Club has been recently formed with the intention of furthering the interest of model flying at the barracks. The Club will hold its events on one of the largest and finest flying fields in the country, the Plattsburgh Parade Grounds, where recently the New York business men encamped. Mr. Regan, Jr., President of the Club, recently made some fine flights with his pusher monoplane and with other members will begin shortly to make models similar to those which now hold world records. Address all communications to Mr. James Regan, Jr., Pres., Plattsburgh, New York.

**North Shore Model Aero Club**

By THORNTON McCUNE.

The North Shore Model Aero Club, of Chicago, which was organized last August is getting along very well. The club has lately admitted a number of new members, and gives promise of being one of the most active in the country by next year. A very satisfactory elimination meet was held and it is expected that those who will represent the club will do better in the finals. The team chosen to represent the club consists of Lindsay Hittle, William Schwieter, Donavan Lathrop and Thornton McCune, with Donald Ayers as substitute.

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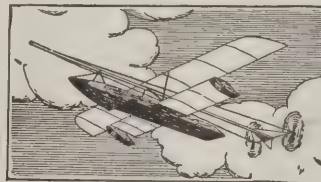
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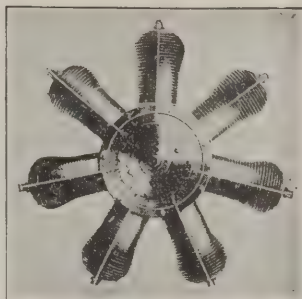


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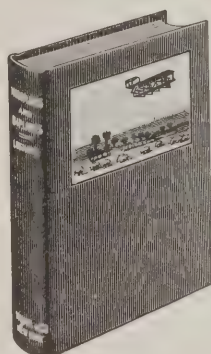
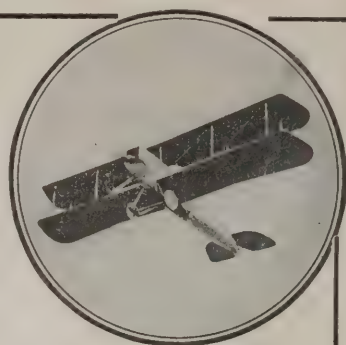
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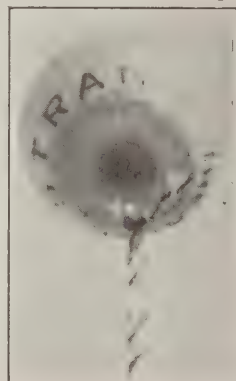
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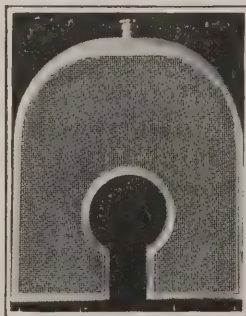
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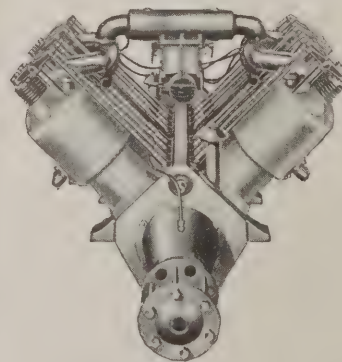
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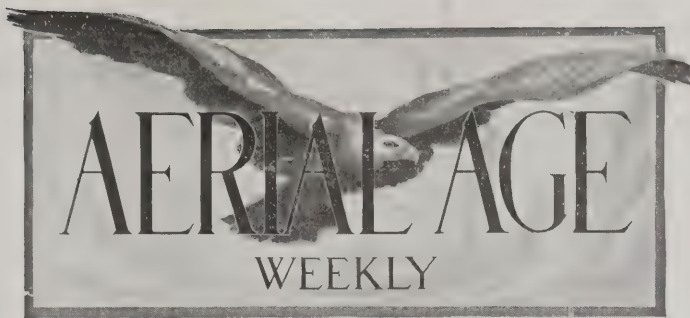
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VOL. II

NEW YORK, November 8, 1915

No. 8

## Christening of "N. Y. N-1" Turns Into National Defense Rally

THE fact that the administration's proposed naval and military programs only provide for the addition of less than 100 aeroplanes to the army and navy's present equipment, which consists of less than 20 aeroplanes, and the fact that the programs do not make any provision for developing aviation corps in the National Guard and naval militia, have caused much surprise and dismay—and those who have been co-operating and supporting the movement to develop aviation corps for the militia find that in addition to that movement they will have to foster the movement to secure substantial appropriations to build air fleets for the army and navy.

If they succeed in securing as much support for a more liberal program as they have for the movement to develop aviation corps for the militia, then there is little doubt that Congress will be convinced of the importance of allowing at least \$7,500,000 for the navy; \$5,000,000 for the army, and \$5,000,000 for the militia, which represents the minimum necessary to give a fair start to the army, navy and militia in aeronautics.

The National Aeroplane Fund, which was instituted by the Aero Club of America for the purpose of developing aviation corps for the militia, has been a remarkable success. Since it was started 20 states have taken up the work of developing aviation companies with the land and water militia. The states of New York and Rhode Island have each received close to \$20,000 with which to start aviation units; the state of Massachusetts has received \$2,500 with which to train eight officers of the National Guard and Naval Militia in aviation; the states of California, Texas and Arizona were given \$1,200, \$400, \$400, respectively, to defray the cost of training militia officers as a preliminary step toward organizing aviation units.

The first tangible result was seen in the christening of the first flying boat presented through the National Aeroplane Fund to the naval militia of New York by Mr. Glenn H. Curtiss.

The christening took place on November 1, and it was, as Governor Charles S. Whitman of New York expressed it, as significant as an expression of the public interest in national welfare and the improvement of our national defenses, as the Plattsburg camps were in demonstrating the willingness of business men to participate and contribute in building a substantial bulwark of national defense.

In view of this importance, Governor Whitman laid aside other duties of the office to come down from Albany to receive the boat on the part of the state, and, as commander-in-chief of the defensive forces of New York. He was accompanied by Mrs. Whitman and their five-year-old daughter Olive (to whom the honor of christening the flying boat had been assigned), and by the governor's official staff.

The event, the first of its kind in the history of the state, brought together a distinguished company of citizens and prominent army and navy officials, for it marked the opening of a new era in national defense, as well as in flying, whose importance can scarcely be overestimated.

Among the military and naval officers present were:

Major-General Leonard Wood, of the regular army; General Dyer, General Eddy, Admiral Usher, Adjutant-General Stotesbury, Captain Lorillard Spencer, Lieutenant-Comman-

der William B. Waite, Major Charles Elliott Warren, Major F. L. V. Hoppin, Commander R. P. Forshaw, Commander of the Naval Militia of the State of New York; Commander Charles L. Poor, First Battalion, Naval Militia of New York; Lieutenant-Commander Belknap, U. S. N.; Lieutenant-Commander Taylor, U. S. N.; Commander Gay, U. S. N.; Lieutenant-Commander Robert Kyle Crank, U. S. N., and former Commander Jacob Miller, of the Naval Militia of New York.

Officers of the Aero Club of America: Alan R. Hawley, President; Henry A. Wise Wood, Charles Jerome Edwards, Vice-Presidents; Robert J. Collier, W. Redmond Cross, Henry Woodhouse, Evert Jansen Wendell, Samuel H. Valentine, Governors; Emerson McMillin, Life Member; Howard Huntington, Secretary of the Aero Club of America; Rear Admiral R. E. Peary, Chairman of the Aeronautical Maps and Landing Places Committee; Alberto Santos-Dumont, Honorary Member.

Among the guests of the Aero Club of America were: Elmer A. Sperry, Robert Glendinning, Clark Thomson, Francis L. Wellman, Lansing K. Tevis, Gordon Tevis, G. Douglas Wardrop, L. D. Gardner, Richard Lounsberry, Truman W. Post, James McE. Bowman, K. M. Turner, George W. Turney, Arthur Williams, Edgar B. Bronson, Burt M. McConnell, J. B. R. Verplanck.

The ceremony took place on the pier of the naval militia at the foot of West 97th street, New York City, where the venerable ship *Granite State*, the training ship of the naval militia, is moored, and was witnessed by more than 5,000 people.

Upon the Governor's arrival at the *Granite State*, he was met by the First Battalion, composed of Companies 1, 2, 3, 4, 5, 6 and 9, in full uniform, under Commander Poor.

A luncheon was served aboard the ship, at which the governor was the guest of honor, then His Excellency reviewed the Battalion on the gun deck of the ship, after which the militiamen were drawn up on the pier, where "N. Y. N-1," as the flying boat is now officially known, reposed for its baptismal ceremony and its actual mustering into the service of the state and nation.

Governor Whitman was introduced by Commander Charles L. Poor and the first words of the state's chief executive showed his profound interest in the development of aeronautics as an adjunct of the army and navy, as they showed his attitude on the subject of national defense. He said, in part:

"I hope that the advance of armament is not going to stop with this one hydroaeroplane, and I feel that this is the pioneer of a great fleet that will soon be marshalled for the defenses of our shores. On behalf of the people of this state, and as commander-in-chief of the naval militia and the National Guard of this state, I must offer the deepest thanks to the National Aeroplane Fund, to the Aero Club of America, which created this fund, and to Mr. Glenn H. Curtiss, through whose generosity we are able to accept this splendid flying boat.

"While it is not possible to man the battleships of the nation with the naval militia, still it will be possible, and more than probable, that the militia will man the flying corps of the navy. We cannot man the battleships and battle cruisers, but we can man the aeroplanes, and this machine is the first of the fleets to come which will be manned by our naval militia.

"I fully realize the importance of the national preparedness movement. I am strongly in favor of safeguarding our coun-

**AMERICA MUST BE RESTORED TO THE POSITION OF SECOND NAVAL POWER.  
EVERY CONSIDERATION OF ITS SECURITY DEMANDS THIS SHALL BE DONE AT ONCE.  
THE PEOPLE WILL BE SATISFIED WITH NOTHING LESS.**



try. We must be prepared to defend American institutions, American liberty and American civilization. The only way to do this is to have a sufficient armament, and as this gift of the National Aeroplane Fund is the first step in that direction, I am doubly pleased to accept it in behalf of the naval militia and of the state of New York."

Mr. Henry A. Wise Wood, Vice-President of the Aero Club of America, and Chairman of the Conference Committee on National Preparedness, representing the Aero Club of America, presented the flying boat to the naval militia in the name of the donor, as well as the Aero Club of America, through which the gift was made. In his address Mr. Wise Wood warned his audience that these were times to be dealt with seriously, and he called upon the American people to reject the plan of unpreparedness, disguised as preparedness, that the Administration has offered through the press. He emphasized the necessity of rejecting the Administration's naval program, which, he said, is wholly insufficient to restore America to the position of second naval power, a position which is absolutely essential to the preservation of our national interests. Mr. Wise Wood's address follows:

"The strange fruits of progress from the tree of knowledge now fall so plentifully that we may be excused if our sense of wonderment be dulled, and we accept without surprise the transformation into monotonous realities of the most fanciful physical romances. So swiftly do the dreams of today become the tools of tomorrow that their change, as they rush past the lattice of consciousness seems but a drama of conjury mocking the Arabian Nights, caught up in a film, its dull moments effaced, and spun off to wring from a jaded word a begrudged measure of applause.

"But today, my friends, I shall ask you to cast aside for a while your weariness of wonders, and to stand once more as children in the gardens of your youth, marvelling at the birds and despairing ever of treading in their company the invisible paths of their kingdom of blue and of gold. I shall ask you once more to feel of the air and to say to yourselves it is nothing; to think witchery of flight and to tremble at thought of the gaunt, bent figure, astride its broom, over to which on Halloe'en the air and the night are given. But do these things as a child and you will be as wise as was the wisest when you were a child. Thus, only, may there be swept from the skies of your mind the otherwise everlasting imprint of man's first flight, of that fiery brand with which you were stamped when first you saw him gather way, and spring lightly into the air. Thus, only, may you again perceive flight as a marvel, for but once is it given to live that eerie, exquisite moment when first we see the transmutation of the man into the bird, and know that into his keeping at last has been thrust the freedom of the aerial fastnesses.

"So, my friends, do but freely discharge your minds of old impressions and come freshly to the moment in which we stand that you may the better judge of this marvellous conquest, the more surely to forecast its astounding possibilities, the more accurately to adjust your efforts to their profitable utilization.

"It is but little more than a dozen years since man and the aerial seas were strangers. When then he launched himself upon their vast expanse he did so timidly, and with no will of his own he resignedly awaited the whims of the wind to carry him whithersoever it pleased. Then, suddenly, man rebelled, and there appeared as his champion one who said that the aerial seas should be broken to the uses of man, and the winds tamed, and the dominion of humanity extended into that boundless ocean upon the floor of which the race had laboriously trudged since its beginnings—and the dirigible was born.

"When, on that midsummer's day, in 1901, Santos-Dumont, clinging to the trembling structure of the world's first airship, awfully guided himself about the Eiffel Tower, man in that momentous hour, took the helm from the hands of his aerial goings and comings. My friends, among you modestly there stands today the hewer of the first aerial highway, the pioneer who, fearlessly and indefatigably drove the initial trial through the vast wilderness of the sky. Of all the poor honors the world has to bestow, which of them is glorious enough to repay such a debt!

"But we must hurry on. Among all the phenomena of science there is no stranger phenomenon than that of the prolificness of science itself. A discovery is made, and lo! there immediately pours forth from its womb a countless progeny of discoveries, each giving birth in its turn to innumerable and various offspring. And thus is fed that rushing cataract of knowledge realized which the world calls progress. So with the secrets of the air. To float, though with guiding purpose, was not enough—man must fly. From the birds there must be wrung the supremacy of their exultation, to be upon man bestowed. This, grimly, man willed,

and having offered for the talisman his life, into the air there flashed the first glistening vehicle of flight—and the highways of air and earth were wed.

"But what of the seas, that restless jostler of the shore, ever inviting man to its conquest, and ever returning him conquered. Were it and the air not also to be wed? Ah, my friends, to this there was no answer half a decade ago. But fervently he believed, and passionately he worked, and gloriously he won—this man who created the craft that rests yonder. And now the seas, and the air, and the earth are one; and they are yours, and they are mine, as that slim craft will testify.

"Who now may say that the West has not been acquitted of its old world debt by these four men of the twin Americas? Or who assert that within recorded time a physical gift so big with promise ever has been made to man?

"Commander Poor, I have been asked to present you with this seaplane, the first aerial craft to enter your branch of our naval service. But before completing my task I feel it my duty to say to you, to your officers and men, a few words upon a very serious subject. I refer to the defenses of your country. When some of you entered this service you may have come lightly, in the spirit of sport. That was as it should have been—then. But the world is in a different mood now; the things to which we held fast, as to the life lines of civilization, have been swept away; fair words that were spoken in promise and cherished in faith have been translated into the sinister languages of denial and war; your own people already have shed their innocent blood on behalf of that "necessity" which places might above right, while in the unmistakable language of action you have been put upon notice that among nations he who would survive must be prepared to defend himself, not feebly but with success. Men, sport now has become duty, and that duty is to be exercised in the self application of the discipline which makes for preparedness. And it is in the calm spirit of one who has determined to prepare himself for action; yes, for sacrifice, if need be, that each of you is now called upon to labor in this patriotic work you have undertaken to perform.

"But it is not you alone who must enter upon the work of preparation; it is your people as a whole; it is they who must hold up the hands of you, their navy and their army. It is they who must give to you both and generously the best—and enough of the best—that the brains of man can devise for the protection of *your* lives in the successful defense of *their* country. To you who defend *them* they owe something that at the moment even those who are clothed with authority and should know seem not to perceive, they owe it to you that you shall not be left so weak as to be tossed, a useless sacrifice upon the bloody altar that has been reared upon the earliest battlefields of every American war—that of criminally inadequate preparedness.

"My friends, all of you, these are times to be dealt with seriously. We have now seen enough of war in action to know that we want it to be not upon our own soil, nor along our own shores, nor made upon us in the form of a cordon of steel, riveted about our coast, slowly to crush us into subjection. We want none of war; we want peace, and we want strength with which to dictate peace before ever a declaration of war can be made upon us. But peace is no product of weakness, nor of parsimony, nor even of the deft use of phrases—nor is it a product of preparation, unless that preparation be so adequate as to render attack hopeless of success. Then armament is peace assured, and who dare say, with the spectacle of Europe before us, that the cost of an assured peace—be that cost any price—is too great for us to pay?

"It is in the vivid consciousness of this unassailable conclusion, my friends, that I now call for the rejection by the American people of the progress of unpreparedness, disguised as preparedness, both as to the navy and the army, that the Administration has offered through the public press.

"And, on behalf of that patriotic movement for national defense, which until recently found Washington cold and dumb, I demand, first, that we be restored at once to the position of second naval power, from which through the weakness of our advisers we were permitted to fall, and, second, that the recommendations of the general staff of the army be revealed and, if adequate, be enacted into law.

"Commander Poor, officers and men of the First Battalion, acting for its donor, the inventor of flight from the sea, and for his humble instrument, the Aero Club of America, I now present you with this new craft."

Commander Poor, of the First Battalion, speaking for the Naval Militia of New York, said that he accepted the flying boat with a sense of responsibility. He characterized the Naval Militia as the men who were behind the men

(Continued on page 186)



# THE NEWS OF THE WEEK

## Government To Build Giant Aeroplane

Secretary Daniels on October 27 signed an order for the construction in the Navy Yard, at Washington, of the largest aeroplane ever built in this country, a plane even larger than the ordinary types in service in Europe.

The proposed plane, work on which will be begun immediately, will have a speed of from 50 to 80 miles an hour, will have a full load capacity of 6,000 pounds and a useful load capacity of 2,200 pounds. The latter load can be distributed between passengers, fuel and weapons. There will be two 160-pound motors, manufactured by contractors, and though it is not definitely stated, it is expected that the plane will carry at least one three-inch gun. The government experts state that the big plane will be able to fly seven hours at the maximum speed.

Several planes of this type are to be constructed at the Pensacola plant, but the first one will be perfected at Washington, because of the superior testing facilities afforded by the wind tunnel and the model basin.

The preliminary work has been in progress for several months in the Bureaus of Construction and Repair and Steam Engineering under the immediate direction of Naval Constructor H. C. Richardson, U. S. N., an air pilot who has made a close study of aeronautics during the last two years.

## First National Guard Aviation Corps in Buffalo

Residents of Buffalo are greatly pleased over the fact that in that city the first aviation corps of the National Guard of the State of New York will be established. This result is accomplished through the agency of the Aero Club of America, whose logical and consistent presentation of the needs of an aerial corps for national defense has brought forth substantial subscriptions to the National Aeroplane Fund.

The first call for volunteers for the new corps will go to men of the 65th and the 74th regiments of Buffalo. The plan was announced at a dinner in Buffalo, and it was authoritatively stated that the plan of organization had the approval of Secretary of War Garrison, Governor Whitman and Major General Ryan, commanding officer of the National Guard of the state. There is now available about \$20,000 for the establishment of the corps. The first training field will in all probability be located on the rifle range of the Audubon Club in North Main street, Buffalo.

Among those present at the dinner mentioned were: General S. M. Welch, Colonel C. J. Wolf, Colonel C. E. P. Babcock, Major Lee H. Smith, Lieutenant Emmons of the

United States army, Lieutenant Pearson of Troop I, Glenn H. Curtiss of the Curtiss Aeroplane company, Evan Hollister, the chairman of the Buffalo chapter of the Security League, and H. A. Meldrum, the president of the Chamber of Commerce.

J. M. Satterfield, President of the Aero Club, of Buffalo, presented the great need for aerial defense. He discussed the lessons of the European war and urged the establishment of the corps as a step toward the attainment of end that all interested in national defenses really desired.

He pointed out that when the corps had been developed to a degree sufficient to warrant it certain members of the corps will be assigned to the army training station at San Diego for the final course of instruction.

Mr. Satterfield, with the approval of the experts present, ascribed the Russian reverses to the lack of aerial scouting and the German success to the immediate use of the information in maps, observations, etc., made by the vast army of German aerial scouts. He presented facts as gathered from an accurate observer showing that the Germans made constant changes in front, striking where most effective blows could be struck, while the Russians made very few changes in front because of their lack of proper aerial defense.

## The Baltic Carried 70 Aeroplanes

After the White Star Liner, the Baltic, sailed from New York City, on Oct. 28, it became known that she carried one of the largest cargoes of war munitions that had ever left the port. Included in the list were 70 aeroplanes. The liner was held for two and one-half hours on account of a shipment of 18 aeroplanes which were late in arriving from the New York Central railroad yards.

## MacGordon and Gilpatric Return to New York

Stevenson MacGordon and John Guy Gilpatric, who have been associated with the Curtiss Aeroplanes, Ltd., of Toronto, have returned to New York City, and will probably associate themselves with some of the aeronautical firms within the metropolitan district.

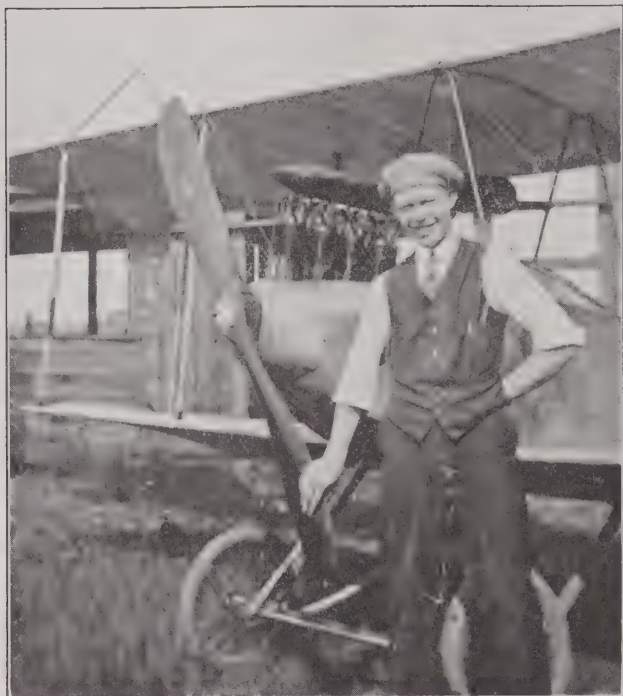
## Fire at New Sturtevant Aeroplane Plant

The aeroplane testing plant of the B. F. Sturtevant Company, in the Readville district, was destroyed by fire on the evening of November 1. An experimental aeroplane was lost and the general damage was estimated at \$12,000.

The new transatlantic type  
Curtiss flying boat on Lake  
Ontario, Canada.







Emil Laird of the Illinois Model Aero Club, who constructed his own machine, and has been doing exhibition flying in the West.

#### James Huneker Makes Flight with Kendrick

James Huneker made a trip in Beryl H. Kendrick's flying boat at Atlantic City and contributed to the *New York Times* an extended article on his mental status before, during and after the trip. The fear which attended him as he went to the boat suddenly disappeared when he sailed over the city. He writes:

"Hello! I was lyrical. It is inescapable up in the air. The blood seethes. Ecstasy sets in—the kinetic ecstasy of a spinning top. I gazed at the pilot. He twisted his wheel nonchalantly as if we were in an earthly automobile. I looked over the sides of the cedar boat and was not giddy, for I had lived years at the top of a Madison Avenue apartment house, ten stories high, from which I daily viewed policemen killing time on the sidewalks; besides, I have strong eyes and the stomach of a drover. Therefore, no giddiness, no nausea. Only exaltation as we swooped down to lower levels.

"I have been asked to describe the sensation of flying. I can't. It seems so easy, so natural (Mr. Kendrick says that any one can learn to guide a machine in midair; the difficulty is to master the descent)."

#### Made a Quick Flight Over New York

P. C. Millman, the aviator, and Maxmillian Schmitt, inventor of the Schmitt tractor biplane, made a quick flight from the Arcola Country Club, near Paterson, N. J., to Garden City, L. I. They were sitting on the veranda of the country club when Mr. Millman remarked:

"Well, I am going to take a passenger over New York this afternoon." A moment later they were in the Schmitt machine and rapidly ascended to a height of 5,000 feet. The course was shaped for Garden City, and the 40 miles were made in just 27 minutes, Millman telephoning back to the club half an hour after their departure.

But there were two incidents on the quick flight that jarred both men a trifle. Over New York City they struck an air hole and dropped at an alarming rate for 1,000 feet. In the descent the nose of the machine went down at an angle so sharp that the clock and several tools were lost overboard and dropped into the city. When they reached Garden City the men were worried over the possibility of the falling articles having struck and killed someone, but as no accident was recorded in the newspapers the next day the aviators came to the conclusion that the lost articles landed either in the river or upon a roof.

The following day Mr. Millman left for Italy, taking with him his mechanic, Vincent Ames, to instruct army aviators.

#### Aeroplane Used in Guard Manoeuvres

In Bergen County, N. J., between Hackensack and the Passaic River the Fifth Regiment of the New Jersey National Guard held its annual maneuvers with an aeroplane and an armored truck participating. On the first day, when a sham battle was staged, the aeroplane did not go up as was planned, because the wind was too strong. But on the second day Capt. "Billy" Meade ascended as military observer and reconnoitered the field with an armored truck having a revolving turret, following along and taking pot "shots" at the airmen. Of course none of the shots hit.

The presence of these two adjuncts of modern warfare added a touch of realism to the scene. To the men in the ranks and to the 15,000 thousand spectators on the field the circling of the aeroplane eloquently testified to the great need of these machines for our national defenses. For it was evident to both soldiers and civilians that without airships in great numbers an army is now at a disadvantage that human ingenuity can not offset.

#### Biplane Swooped Down on "Christy" Mathewson

"Christy" Mathewson, the base ball player, was engrossed in a game of golf on the links of the Arcola Country Club, near Paterson, N. J., the other day when Maxmillian Schmitt, the inventor of a biplane, swooped down toward him like a hawk after a chicken. Mathewson suddenly saw a great shadow; then there came the whirr of the motor and after one wild glance upward, the ball player, with all the agility of long practice in short runs, sought safety behind a huge tree. Mathewson's nerves were so shaken by the sudden appearance of the great creature of the skies that after several ineffectual attempts to coax the ball toward the hole, he gave up and returned to the club house leaving his companion to finish the course alone.



Stupar tractor built for Mr. W. A. Christensen by the Chicago Aero Works.



### Domenjoz Loops at Sheepshead Bay

Domenjoz, the Swiss aviator, thrilled the 25,000 spectators at the Sheepshead Bay Speedway on November 2nd. Tremendous interest was shown in his looping, and little attention was paid to the auto racing while the airman was in the air. His demonstration, and the interest evinced in it, augur very well for the week-end meets which will be held at the Sheepshead Speedway commencing next spring. The arrangement for Domenjoz's flights were made through Mr. G. J. Kluykens.

### Puget Sound Aerial News

With the arrival of Boeng's new Martin tractor aeroyacht a few days ago aeronautics has received a new impetus and the interests should continue to increase as other sportsmen plan to take up flying with Boeng. With the boat came Floyd Smith, the looper from the South now connected with the Martin Company, to put the machine through its paces before turning it over to its new owner. The machine behaved admirably. It is a standard Martin model with the addition of two five-foot sections to increase the lift and to decrease the speed somewhat.

Two more machines are being built here for Boeng and before spring several other members of the Northwest Aero Club will have aeroplanes. These will be housed at the club's large hangar on Lake Union.

Aviator Herbert Munter, who was the first aviator to join the Northwest Aero Club, is back after a very profitable season.

T. T. Maroney has had his pupils out for flights a great deal lately.

Ed. Hubbard is making some fine landings with the hydro-aeroplane.

Miss Ruby Rutledge is progressing rapidly with the land machine.

Gustav Strommer, of Tacoma, did some great flying at Astoria in connection with the boat races there.

Aviator Arneson, the monoplane pilot, of Tacoma, had an accident at Siyo, Oregon, in which his machine was damaged.

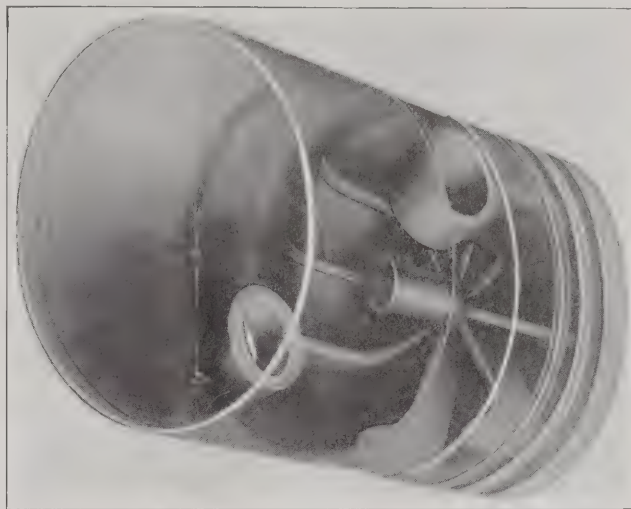
Aviator Culbertson, who recently fell in Los Angeles, was in Seattle last week.

### Sturtevant News

Mr. Channonhouse, connected with the Aeronautical Motor Testing Department of the B. F. Sturtevant Co., arrived home recently, after a three months' visit to England, and is now busy entertaining his friends with stories of his experiences during the recent Zeppelin raids in London.

The object of his visit to England was to witness the official trials before the Admiralty of the first lot of the Sturtevant 140 h.p. eight-cylinder aeronautical motors, shipped to England. The trials took place at Hendon, the famous flying district just outside of London.

The Sturtevant motors were installed in military biplanes, built by the Burgess Co., of Marblehead, these machines



New system of reinforcing ribs for Magnalite pistons.

being designed to carry an observer, together with a rapid firing gun. This type of aeroplane is known among the English airmen as a "gun bus."

Mr. Channonhouse states that the trials were very successful, not a single mishap occurring, and that upon conclusion of the tests the officials representing the British Admiralty congratulated the B. F. Sturtevant Co. upon the remarkable results obtained from the Sturtevant "eight."

During one of the preliminary trials Commanding Officer Busted, of the Royal Flying Corps, together with an observer and carrying a machine gun, made a record climb of 1,000 feet in less than three minutes and upon descending stated that at no time was the motor running at its maximum speed. Several members of the French Flying Corps, who were present during the flights at Hendon are very enthusiastic in their praise of the Sturtevant motor.

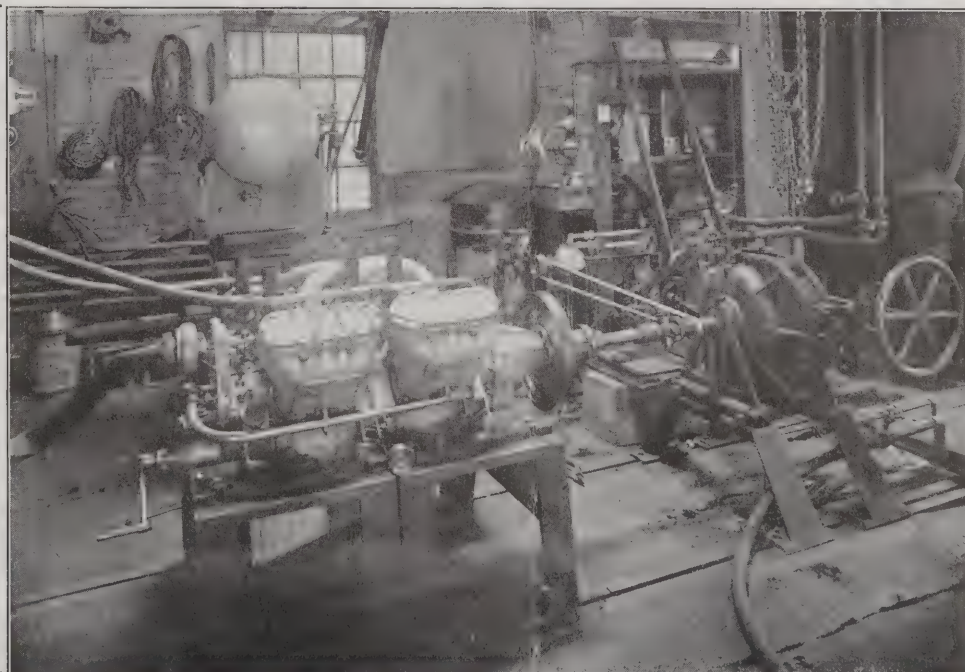
### New System of Reinforcing Ribs for Magnalite Pistons

A new system of reinforcing ribs for Magnalite Pistons devised by the Walker M. Levett Co., of New York, is illustrated in the accompanying engraving made from an X-ray drawing.

A study of the illustration will show that the carrying strength of these pistons is so distributed that every possible stress under extremely high speed is provided for. At the same time a construction is permitted which assures a minimum weight for the piston, with a consequent lessening of weight at the vital point of the reciprocating parts.

The claim is also made in behalf of this type that quick thermal conductivity is permitted in using Magnalite Pistons.

A corner of the new Thomas aeromotor factory at Ithaca, New York.





## CALIFORNIA FIRST IN CURTISS MARINE FLYING CONTEST

THE Curtiss Flying Trophy contest closed on October 31, and from the scant details available at date of going to press it appears that California has won the much sought distinction of winning the first competition for the trophy.

A ripple of excitement was created at the Aero Club of America and among all interested in aeronautics by the receipt of a telegram from Glenn L. Martin, of Los Angeles, announcing that Oscar A. Brindley, until lately with the United States Army Aviation Corps, at San Diego, Cal., had established a new record in his efforts to win the Curtiss trophy. Within the prescribed period of ten hours he flew 554 miles, beating the best previous record by 74 miles. This former record had been made by David H. McCullough, of Newport, Pa., who last year flew 480 miles in 7 hours and 45 minutes.

Mr. Martin's telegram was as follows:

"Am pleased to announce Oscar Brindley's successful flight of 554 miles.

"His official time was from 6:20 a. m. to 4:20 p m., without passenger.

"Observers' official reports with affidavits will be mailed to contest committee.

"Flight was made in a Martin military tractor hydroaeroplane.

"Raymund V. Morris in Curtiss flying boat became lost in haze on first trip. Compelled to land in Los Angeles harbor."

From telegrams received it appears that Raymond V. Morris made a remarkable record of 2,500 miles in competing for the trophy.

David H. McCulloch, who had already made a record of 480 miles, bettered this record in another attempt, the details of which are not yet available.

There was widespread interest in the East in the determined effort which Beryl H. Kendrick made on Oct. 28 to win the trophy in a flight from Albany, N. Y., to Cape Hatteras. He made a splendid showing and would in all probability have accomplished the work that he assigned himself to do had he not had the misfortune to become enveloped in a dense fog off the Delaware Capes—a fog of such magnitude that he could neither find a way out to the right or the left nor by climbing upward. So after making 370 miles and losing his direction he landed on the surface of the ocean, where after a wait of some time he discovered a fishing boat, the skipper of which supplied him with fuel and gave him his bearings. Though he fell 380 miles short of the distance he had hoped to make in the ten hours allowed to the contestants, Kendrick's feat will be remembered by sportsmen as a worth-while event.

Mr. Kendrick rose from the Hudson River, opposite Albany, at 8:30 a. m., and after making a preliminary circle by the way of a test he ascended to a height of 800 feet and shaped his course southward, following generally the course of the river. As he passed Tarrytown, N. Y., he was flying at an altitude of 2,000 feet, from which altitude he gracefully descended to Ardsley. From that point he sped over the surface of the Hudson to Edwin Gould's yacht pier, where he replenished his fuel, tightened a stay or two and again went on his way at 11:30 a. m.

It was expected that Kendrick would take fuel at Bayhead, N. J., but at 1:06 p. m., he passed that town at the rate of 65 miles an hour, flying low along a course that took him well out over the water.

He was making good time under favorable conditions until he struck the fog banks off the Delaware Capes. There his troubles began, because the great clouds completely shut off the sun and the moisture was so intense that his compass glass was dimmed. For two hours he tried to extricate himself from the banks by turning shoreward, and again seaward, by climbing to great altitudes and again descending. But in no direction could he find an open aisle. Instead, his efforts appeared to drive him into denser banks. His only landing had been made at the Gould pier and his supply of fuel was nearly exhausted when he reluctantly alighted on the surface of the water to await a new turn of events.

Mr. Kendrick had begun to fear that he would have to spend the night groping about for a means to escape when, soon after 4 p. m., the mist began to lift and he saw a power driven fishing boat two miles away. With his last bit of fuel Kendrick rose and bore down upon the lone fisherman. Upon explaining his mission and his plight the captain quickly replenished his tanks, gave him his bearings and watched him wing himself out of sight just like other water birds that ap-

pear and disappear while the fishers ply their calling.

At 5:30 p. m. Mr. Kendrick landed at Ocean City, Md., dripping wet from his long exposure to the fog and from the water his boat had shipped in making the landings, but even then he was undismayed and hoped to make another try for the prize.

Later, however, a board was broken in the bottom of his boat while making an exhibition flight and it was announced that he had given up his avowed intention of flying back Northward.

On Oct. 29 John Lansing Callan, of Albany, and Dudley Martin, of Philadelphia, made an attempt to win the trophy in a flight at the Philadelphia Navy Yard, but after circling around for several hours they became lost in a fog and landed in the back channel of the navy yard. In doing so they narrowly escaped a collision with a battleship, the dark hull of the Ohio suddenly looming up through the fog. The aviators were able to turn the boat just in time to avoid running into the steel side of the fighter. Then the aviators tried to borrow a compass from the Ohio, but there was none to be had, so they waited alongside the ship until the fog lifted.

With them, as with Kendrick, weather conditions over which they had no control largely determined the outcome of the trial.

### The Entries Made During the Year

Among the entries recorded for the Curtiss trophy were the following:

Raymund V. Morris, 160 h. p. Curtiss flying boat, representing the Aero Club of America.

Lawrence B. Sperry, 80 h. p. Curtiss flying boat, representing the Aero Club of America.

David H. McCulloch, 100 h.p. Curtiss flying boat, representing the Aero Club of America, who, until the flight of Brindley, had made the longest flight for the Trophy, one of 480 miles.

Robert Glendinning, 100 h.p. Curtiss flying boat, representing the Aero Club of Pennsylvania, who made a flight of 160 miles in competition for the trophy.

Theodore C. Macauley, 160 h.p. Curtiss flying boat, representing the Aero Club of America, who competed twice for the Trophy, covering approximately 278 miles the first time and 427 miles the second.

Clarke Thomson, a Curtiss flying boat of 100 h.p., representing the Aero Club of Pennsylvania.

E. K. Jaquith, 100 h.p. Curtiss flying boat, representing the Aero Club of America.

Beryl H. Kendrick, a 100 h.p. Curtiss flying boat, representing the Aero Club of America.

Oscar A. Brindley, a 150 h.p. Martin Military Tractor hydroaeroplane, representing the Aero Club of California.

William E. Boeing, President of the Aero Club of the Northwest, Martin seaplane of 150 h.p., representing the Aero Club of the Northwest.

Glenn L. Martin, Martin 150 h.p. seaplane, representing the Aeronautical Society of California.

Lieut. H. A. Dargue, U. S. A., Martin seaplane equipped with a 80 h.p. Curtiss motor, representing the Aero Club of America.

Robert G. Fowler, Burgess-Dunne seaplane, equipped with a 100 h.p. Curtiss motor, representing the Pacific Aero Club.

### New Aerial Rifle Equalizes the Recoil

Gregory C. Davison, vice-president of the New London Ship and Engine Co., has invented a new aerial rifle, which is being tested daily at an isolated spot on the Thames River. The distinguishing feature of the gun is the arrangement for equalizing the recoil and thus preventing the discharge of a shot from capsizing an aeroplane. There are twin barrels, but instead of being placed side by side, as in a shotgun, the barrels are said to point in opposite directions, being joined at the breech. Both barrels are fired simultaneously, one firing a shot and the other a blank to avoid the effects of the recoil.

### Micropho-Detector Co. Incorporated

The Micropho-Detector Co. has been incorporated under the laws of New York, with a capital stock of \$10,000, to deal in electrical devices, microphones and wireless instruments. The incorporators are Frank O'Donnell, R. H. Waddell and H. H. Nieman, 220 Broadway, New York City.



## SANTOS-DUMONT VISITS SPERRY PLANT

ONE of the first requests that Mr. Santos-Dumont made after his arrival in the United States was to see the remarkable line of aeronautical instruments that the Sperry Gyroscope Company are making. A party, which included Messrs. Lansing K. Tevis, Henry Woodhouse, Richard Lounsbury and F. D. Dittman, visited the Sperry Factory at the invitation of Mr. Elmer Sperry and were shown the newest instruments that were being made for making the aeroplane more stable, safer and easier to drive.

The compasses with radium indices for night guidance and their floating dials were the first instruments seen. Then the party were shown the invaluable drift indicator by which an aviator can lay his course by chart and automatically correct his drift in varying winds. By a simple telescopic view and a twist of a wheel, this delicate instrument corrects errors in direction and makes it indispensable for flying across country in areas which are unfamiliar.

The flashing search light is used to facilitate night flying, guarding against collisions, and is also made for signalling purposes.

But the most important product of Sperry genius is the famous stabilizer which in effect is a gyroscopic pilot. Mr. Santos-Dumont and party were surprised to find that in addition to the piloting features of the instrument there has been recently added a target-sighter for bomb-dropping.

The target sighter is an attachment to the gyro unit of the standard aeroplane stabilizer. It consists of a special telescope so mounted that it can be set at any necessary angle relative to the true horizontal and held there by virtue of the gyro unit.

The telescope is one of special design, and in order that maximum accuracy may be obtained it is supplied with cross-hairs, the charts each having been calculated at a different speed with reference to the air, *i. e.*, fifty, sixty and seventy miles per hour respectively. Each chart contains several curves, which have been calculated to take into consideration the speed with reference to the earth, and the altitude. Each

chart carries three scales, a scale of angles placed longitudinally, a scale of altitude placed parallel to the scale of angles, and a scale of altitude, placed laterally.

The aviator determines at what speed the operation of the aeroplane is at its best, and places the chart corresponding to that speed on the holder before starting the flight. In order to obtain the final setting of the telescope it is necessary first to determine the speed with reference to the earth. This is accomplished in the following manner: The altitude is determined by means of the barometer and the telescope is turned until the pointer indicates the correct altitude on the longitudinal scale of altitude. A convenient object is selected that will come within range of the telescope when inclined at the angle, and at the instant the object passes the lateral cross-hairs a stop-watch is started and the telescope turned until it is vertical. The machine is then steered so that it will pass directly over the object. At the instant the object passes the lateral cross-hairs the second time, the time required to pass over the distance is noted. This determination of speed with reference to the earth is done at a distance of from one to five miles before the object to be struck is reached.

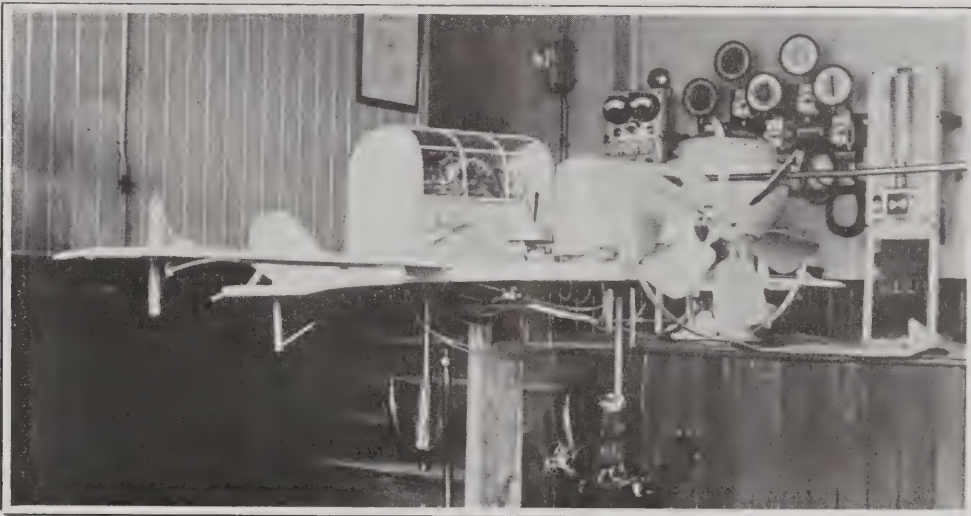
The final setting of the telescope is made by finding the point of intersection with the altitude, as obtained from the lateral scale of altitudes, and the pointer set at this intersection.

The bomb is dropped when the machine is headed directly for the object to be struck. At the instant the object passes the lateral cross-hairs the bomb is released.

This remarkable addition to the effectiveness of the aeroplane was instantly recognized and it is believed that it will add immeasurably to the combat qualities of aircraft.

Mr. Lawrence B. Sperry is now in England working on an aerial torpedo, the details of which have not been announced by the Sperry Company, although the press has had general accounts of it. The new building for the exclusive manufacture of Sperry products will be completed early in 1916.

The miniature gyroscope which the Sperry Gyroscope Co. of Brooklyn uses for demonstration purposes.



### American Aviators Doing Excellent Work in France

Twenty-three Americans are enlisted in the Franco-American Flying Corps, serving France with the double object of aiding that country in its struggle for existence and of so equipping themselves that they can be of unusual value to their own country in case of need. Seven of these adventurous spirits took part in the great drive against the Germans, and three of them were mentioned in general orders for conspicuous bravery.

The seven men who participated in the drive are:

Lieut. William K. Thaw of Pittsburgh, Sergt. Elliot C. Cowdin of New York, Sergt. Norman Prince, Boston; D. G. Masson, San Francisco; Bert Hall, Bowling Green, Ky.; James J. Bach, New York, and H. G. Gerin.

The three who won official recognition are Lieut. Thaw and Sergts. Prince and Cowdin.

The French government recently permitted correspondents to visit a point where the French Aerial Corps has mobilized an aerial fleet, and one of the correspondents thus pictures what he saw:

"The aviation field is a vast inclosure, ten times the size of Belmont Park. Entering the field, monster battle planes loomed up thirty feet high, with a number of planes stretching 130 feet across. Further back was ranged the fleet of battle cruisers and scout planes. They were formed like a battalion, twenty planes in a row across the front and ten deep. Their huge wings made a front half a mile wide.

"The battle planes and all the cruisers were armed heavily. Each carried both the three-inch cannon and the rapid-fire gun.

### Maxim Device to Time Explosion of Torpedoes

Hudson Maxim, of the Naval Advisory Board, has been in consultation with Secretary Daniels in regard to a timing device for aerial torpedoes. Mr. Maxim will take up the matter with the ordnance experts for a test. By the use of this machine it is understood that an explosive dropped from an aeroplane can be timed to go off at the will of the pilot.



## A NEW VARIABLE CAMBER DEVICE

IN an article on "variable camber" from the pen of Lieut. B. T. James, R.E., which appeared about two years ago, the following—possibly prophetic—passages occurred:

"The problem which designers must now face is the production of a machine with a greatly increased speed-range, which can fly at high speeds, and whose speed can be reduced for landing to 45 miles per hour or thereabouts.

"Theory tells us that there are two methods by which this result can be obtained—firstly, by increasing or decreasing the wing surface while the machine is in the air, and, secondly, by increasing or decreasing the camber of the wings.\* Of these two methods, the first can be dismissed without much comment as being beset with too many practical difficulties to be possible, at any rate for some time; but this is by no means the case with the second method, the difficulties here being by no means insuperable. For instance, it should be quite possible to construct a machine having three main wing spars instead of the conventional two, and to increase or decrease the camber of the wing by altering the relative positions of these spars. The same movement could probably be used at the same time for the lateral control of the machine if suitable arrangements were made.

"Many practical difficulties exist in the design of such a machine, chief among which would probably be the design of the ribs."

Incidentally, a variable camber device was patented several years ago by R. Esnault-Pelterie. Lieut. James, however, was not, in the article under consideration, concerned with the *methods* of varying the camber in flight, but with the *results* of such a process. The following were his conclusions:

"Briefly summing up, the following advantages would seem to be obtainable from a machine with wings of variable camber—*viz.*, a very high maximum flying speed combined with a very low proportionate landing speed, and also a better climbing rate and a better gliding angle than could probably be obtained with wings of fixed camber, because—and here lies the root of the matter—the pilot of a variable camber machine can always adjust his wings to the best possible camber for whatever he wants the machine to do: if he wants to glide, he sets his wings to the best camber for gliding; if he wants to climb, he adjusts them to the best camber for climbing; and if he wants to fly fast, he opens his throttle and reduces his camber and away he goes.

"I should like to point out also that I have, if anything, rather underestimated the possibilities of the variable camber machine, which, in the light of what has recently been achieved by British designers with the fixed camber type of machine, should give even better results than I have indicated."

These conclusions, I may add, appear to me to be thoroughly sound, though, purely as a matter of personal preference, I should incline to the solution of the problem by means of the variable angle of incidence, albeit the latter suffers from the disadvantage that a plane of fixed camber and section is less efficient at, say, high than at low speeds. Theoretically, the ideal method would be to vary both incidence and camber

conjointly. However, either method by itself—given that the purely mechanical difficulties can be satisfactorily overcome—would possess great advantages in respect of speed variation over existing types of aeroplanes.

Hence the following description of a variable camber device invented by Mr. Walter Villa Gilbert should be of distinct interest. Of course, it is essential with modern fabric-covered wings that the actual area of the surfaces should remain constant. This is the case with the present device. The drawings show diagrammatic views of the device as incorporated in the structure of an aeroplane wing. Three spars—1, 2, and 3—are required. The operation of the apparatus is as follows:

If the two points *a a* are drawn towards each other, the two base short spars *b b* are moved outwards and downwards, and the leading spar, 1, and the trailing spar, 2, are drawn towards each other, thus increasing the camber. Whilst this is happening the outward extremity is moved slightly downward. When the two points *a a* are separated from each other, the movements of all the parts are reversed, so that the camber is decreased, or, in other words, the cross-section of the wing becomes flatter.

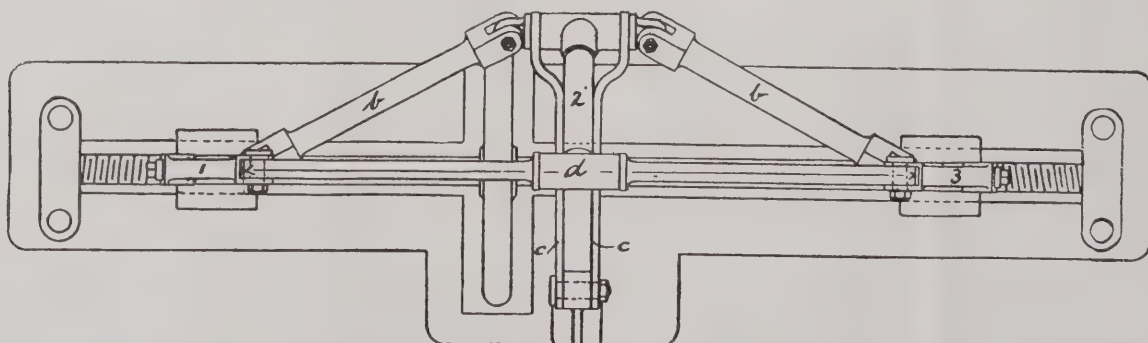
As to the stresses in the different members of the wing, it should be noted that when the machine is flying both the leading spar and the trailing spar are in tension, whilst the central spar, 3, is in resolved compression. This should enable the constructor to use spars made either of wood of smaller section than at present customary or of light metal such as "Duralumin." It should also enable the constructor to dispense with at least a considerable number of the stays hitherto found necessary.

Mr. Gilbert's proposal as to the ribs is that they should be pivotally mounted on the leading spar, and that to allow them to follow the changes of the relative positions of the spars they should be made of a flexible framework latticed together.

It is not necessary that the leading and trailing spars should be equi-distant from the central spar; for example, the distance between the trailing spar and the central spar could be twice that of the distance between the leading spar and the central spar, which construction would give, of course, a section of wing considerably curved at the leading portion and flat at the trailing portion, thus according to existing shapes.

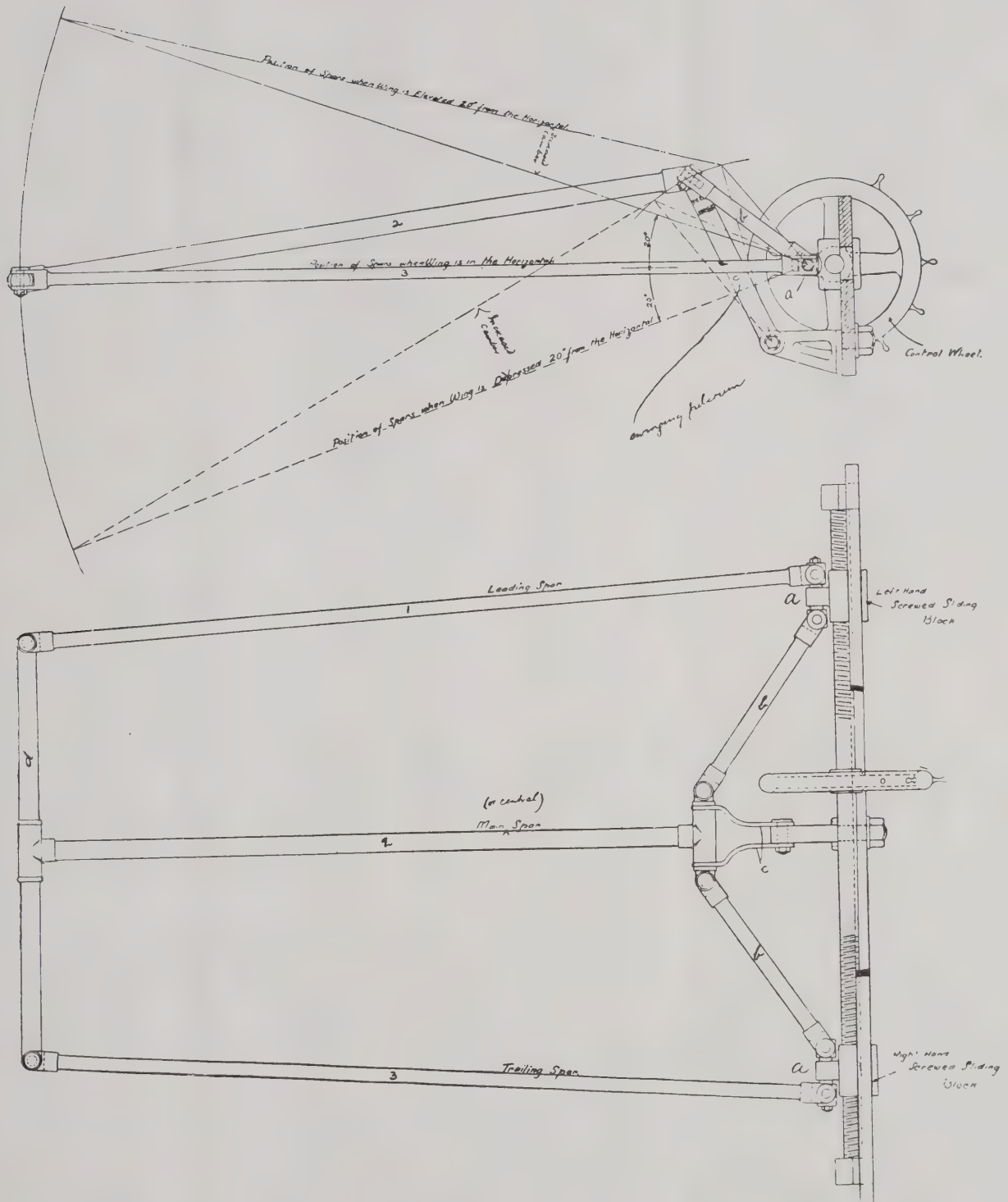
A peculiar feature of the design is that in operation it virtually duplicates the actions of a bird's wing—not that Mr. Gilbert has in view at present a system for "flapping wing" flight; but he has found on analysis of the motions of the apparatus that, both in the fore and aft direction of the machine and the longitudinal direction of the wings, compound differential trajectories are imparted to the apparatus when the points *a a* are drawn together.

J. H. L.



Front Elevation of the Gilbert Variable Camber Device





The Gilbert Variable Camber Device

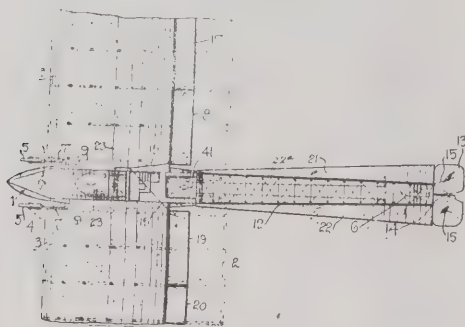


# RECENT AERO PATENTS

BY WILLIAM N. MOORE

1,150,970. AEROHYDROPLANE. JACOB SCHLESINGER, Lansing, Mich.  
Filed Sept. 19, 1914. Serial No. 862,590. (Cl. 244—29.)

1. In a flying machine, upper and lower transversely extending main planes, the lower plane being in two sections, means for supporting the aviator between the two lower planes, ailerons extending entirely across and pivoted to the rear edges of each of the two sections of the lower plane, means for angular adjusting the ailerons, a tail frame extending rearward from the main planes below the level of the lower main planes, vertical and horizontal rudders attached to the end of the tail frame, and laterally disposed rudders hingedly mounted upon and extending entirely along the sides of the tail frame, said rudders being relatively wide at their rear ends and tapering to the width of the tail frame at their forward ends, said rudders being independently angularly adjustable.



1,151,172. AEROPLANE. WILL V. GAGE, Primero, Colo. Filed Mar. 25, 1914. Serial No. 827,146. (Cl. 244—29.)

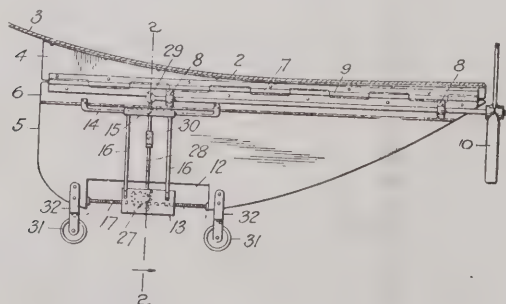
1. In a flying machine, a supporting plane curving upwardly at its front-end, and in transverse section, curving centrally downwardly, and reversely at its outer portions.

2. A flying machine comprising a supporting plane curving upwardly at its front-end, and in transverse section, curving centrally downwardly, and reversely at its outer portions, and a keel plane connected at right angles to the supporting plane, in the plane of the longitudinal axis of the same.

3. A flying machine comprising a supporting plane curving upwardly at its front-end, and, in transverse section, curving centrally downwardly, and reversely at its outer portions, a rib connected at right angles to the supporting plane, in longitudinal axis of the same, truss rods between said ribs and said plane, and a keel plane pivotally connected with said rib.

4. A flying machine comprising a supporting plane, a keel plane connected to extend in a plane of an axis thereof, a screw mounted on the keel-plane, a carrier, and a nut rotatably mounted on the carrier and fitted on the said screw.

5. A flying machine comprising a normally vertical keel-plane, a supporting plane laterally tiltably connected therewith, a carrier mounted on the keel plane to move longitudinally with relation thereto, and appliances for the adjustment of said supporting plane and said carrier.



1,150,436. AERIAL PROPELLER. ARTHUR ALEXANDER DASHWOOD LANG, London England. Filed Mar. 27, 1914. Serial No. 827,775. (Cl. 170—159.)

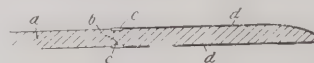
1. Aerial propellers made of wood, a metal sheathing for the end portions of the blades comprising a metal covering electrically deposited upon the end portion of each blade and uniting with an endless metal band laid in a groove and tightly encircling the blade, as set forth.

2. Aerial propellers made of wood, a flush sunk band of metal encircling each blade, and a sheathing of metal electrically deposited on the end portion of each blade and uniting with the flush sunk metal band, as set forth.

3. Aerial propellers made of wood, a flush sunk band of metal tightly encircling each blade, flush sunk metal strips secured in the end portion of each blade, and a sheathing of metal electrically deposited on the end portion of each blade and uniting with the flush sunk metal band and flush sunk strips, as set forth.

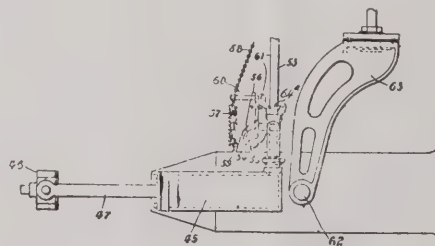
4. Aerial propellers made of wood, a flush sunk band of metal laid in a groove and encircling each blade, a packing between said metal band and the groove, and a sheathing of metal electrically deposited on the end portion of each blade and uniting with the flush sunk metal band, as set forth.

5. Aerial propellers made of wood, a flush sunk band of metal laid in a groove and encircling each blade, a packing between said metal band and the groove, flush sunk strips of metal secured in the end portion of each blade, and a sheathing of metal electrically deposited on the end portion of each blade and uniting with the flush sunk metal band and the flush sunk metal strips, as set forth.



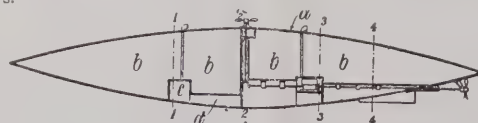
1,151,967. APPARATUS FOR DISCHARGING EXPLOSIVES FROM FLYING-MACHINES. WILLIAM GUNN PRICE, New Castle, Pa., assignor of one-half to Kay & Totten, Pittsburgh, Pa. Filed July 29, 1910. Serial No. 574,566. (Cl. 244—1.)

In apparatus for discharging projectiles from aeroplanes, the combination of a suitable shell or casing, a movable member therein, a spring interposed between said member and the inner end of said casing, a catch on said member adapted to engage the projectile contained within said casing, an air cylinder, a piston therein, and connections between said piston and said air cylinder and said movable member to compress said spring.



1,150,650. AERIAL MACHINE. WILLIS STETSON WILLIAMS, Manchester, England. Filed Sept. 20, 1913. Serial No. 790,874. (Cl. 244—6.)

In an aerial machine a body of circular shape in cross section the skin of which is constructed of the commercial product multi-ply wood and the interior of which is divided into a number of cells or compartments, some of which are adapted to form or contain the aerostats and others of which are adapted to contain the machinery or to form cabins for passengers.







# FOREIGN NEWS



## CEYLON

Two military aeroplanes have been presented to the British War Office by Ceylon, the funds having been collected by public subscription.

## FRANCE

In a practice drill undertaken in an effort to minimize the damage occasioned by Zeppelin raids, Paris was plunged into almost complete darkness recently for an hour. Nearly all lights throughout the city were extinguished. The experiment was said to have been a complete success.

A squadron of French aeroplanes has been assembled at Salonica and is now being employed against the Bulgarians.

Sergeant Aviator "G. C." of the French Aviation Corps, describes how he destroyed a German captive balloon and an aeroplane on one trip in a letter to friends at Fontenoy-le-Comte, where he was a high school teacher.

"It was our fourth attempt," writes the aviator, "to attack a famous balloon so well guarded that we never were able to get near it. When we got over the Boche lines I saw it emerging from a sea of clouds fifteen miles away. We made a wide detour to get to windward. On the way we came upon a sentinel aeroplane which did not appear to see us. I signalled our pilot. He dropped vertically upon the enemy. My position was precarious, my body hanging out over space, clinging to a strut with the left hand, my right hand on the butt of a machine gun. At 350 yards I opened fire. Instantly the Boche swerved and tried to flee, but he got across us and I gave him a broadside. He pitched downward into the clouds. We were then within three miles of the balloon. We advanced crab-wise, jumping from cloud to cloud. The balloon didn't budge. We got close up. I gave the sign and we swooped upon him. When 300 yards above it I opened fire with the second gun. In twelve seconds it was all over. I leaned over and could see the balloon, half deflated, lying on the trees. The German batteries saw nothing and did not fire on us."

## GERMANY

Considerable aerial activity featured in the official report from Berlin October 24th: "Enemy aviators bombarded Ostend," it stated, "and the Noyon railroad station without result. (Ostend is on the Belgian coast, and Noyon is in France between the Somme and the Oise.)"

"In an aerial battle south of St. Quintin an English double-decked machine was brought down and the pilot and observation officers were killed. German aviators attacked, apparently with successful results, the English camp at Abbeville (north of Amiens). Bombs also were dropped on Verdun. Hits were observed."

The growth of the movement in Germany to put an end to Zeppelin raids upon open cities has brought forth articles of severe condemnation in several papers.

The *Berliner Morgenpost* says this movement is "un-German," and adds: "On the occasion of the last raid on London such hellish fire was opened on the Zeppelins by at least fifty batteries stationed right in the center of the city that it becomes ridiculous to speak any longer of London as an undefended town. What makes the whole affair abominable in British eyes is the disagreeable and undeniable fact that they are unable themselves to construct really serviceable airships. Those they possess are mere toys." To this circumstance we owe our immunity from British air raids."

The *Vossische Zeitung* denounces the anti-Zeppelin movement in Germany, saying:

"The raids are of vital importance, and must continue in London if abandoned elsewhere. To make the Englishman feel, you must attack him in the weakest spot; destroy his property, his banks, his money, his spinning establishments. This is best done by King Zeppelin. The character of the Englishman has long remained an enigma to many people, but those who have travelled outside of Germany read it correctly enough."

"If in the course of your travels an Englishman should hustle by you and tread on your toes you should never beg his pardon, for if you do he will treat you with the utmost disdain. If, however, you deal him a blow in the ribs, the Englishman will beg you most amiably to excuse him."

"This is the result of personal experience in the course of intimate dealings with Englishmen. We must apply personal experience to our warfare against England. Translated into good German this means: 'Our Government must repeat again and again with ever growing violence the Zeppelin raids on London and other fortified English towns.'"

## GREAT BRITAIN

Sir John French's report of October 24 stated that "on the 22nd four of our airmen had engagements in the air and in each case the German machines were either forced to descend or were driven away. One of the German aeroplanes dived head first from a height of 7,000 feet into a wood just behind the enemy's lines."

In the correspondence of the Associated Press great praise is given to the work of the British air fleet at the taking of Loos. The aeroplanes were concentrated in numbers on the front as well as the armies. The correspondence continues:

"Every youth in England apparently wants to get into the aerial service. So the corps has its pick. Promotion is rapid; the romance and the excitement of the work appeal. It is easy to learn to fly in the very stable latest types of machines which, as the saying goes, are 'fool-proof.' It takes only two months to train a man with aptitude to do the routine work of reconnaissance, but he must be young. Men do not learn readily after they are thirty, with few exceptions, and they are very poor pupils indeed after they are thirty-five. It is not difficult to spot shells when only a few batteries are firing, but when perhaps a hundred guns are dropping shells on a half-mile front of trench a highly-trained eye is required. Occasionally a plane was observed to sweep down like a hawk which had located a fish in the water. At all hazards that intrepid aviator was going to identify the shell-bursts of the batteries which he represented. The Germans might have him in rifle range, but they were too busy trying to hold back the English infantry to fire at him. Other aeroplanes were dropping shells on railroad trains and bridges, to hinder the Germans, once they had learned where the force of the attack was to be exerted, from rushing reinforcements to the spot. For that kind of work, as for all along reconnaissances, the aviators like low-flying clouds. They slip down out of these to have a look around and drop a bomb, and then rise to cover before the Germans can bring their anti-aircraft guns to bear."

Premier Asquith does not approve the suggestion that the government sequester private securities in England, of the German Emperor and rulers of German States and hold them as securities for damages caused by Zeppelin raids. The Premier informed the House of Commons, through David Lloyd George, minister of munitions, he did not consider the scheme offered "a practical method of deterring the enemy from further violations of International law."

Watching for Zeppelins is a new form of volunteer duty not yet recognized by the British Government. It is undertaken by men who have nervous women to look after, and it consists in searching the sky from 9 p. m. until about 2 a. m., on the theory that this is the time the "Zeps" are likely to operate. In the districts which have been bombed heretofore, the feeling of uneasiness is still strong, especially in families with children, as time is needed to carry them to the basement or lower floor. Here the watchers organize themselves and divide up the watches. They are known and unofficially recognized by the police. These organizations practise surprise drills, and have arranged telephone connections with the small shopkeepers who have friends in the suburbs.

Two men, whose names are withheld, have been delivered by the civil authorities into the hands of the military for court-martial. They are charged with having given signals from the roof of a hotel at the time of a recent Zeppelin raid over the London area.

## ITALY

Teutonic aeroplanes made three separate attacks with incendiary bombs on the city of Venice during the night of October 15-16. The greatest damage was done by a bomb which crushed in the roof and costly ceiling of the church of Scalzi. Another missile fell on the piazzetta of St. Marks, in front of the Ducal Palace. The official statement said:

"Enemy aeroplanes made two attacks, separated by a short interval, on Venice, October 15, throwing many bombs, some of which were incendiary. The first attack was at about 10 p. m. One bomb fell on the roof of the church of Scalzi. It crushed in the ceiling, which was ornamented with beautiful sculptures by Tiepolo. An incendiary bomb fell on the piazzetta of the Cathedral of St. Mark, in front of the Ducal Palace, without doing any damage. Five other bombs fell either in canals or on palaces in the city, where only slight damage was done. The aeroplanes returned at about 11 p. m. One bomb fell in the court of an almshouse and set fire to piles of wood. Two other bombs exploded without doing any damage. No one was hurt."

The accompanying photograph shows the type of machine now in use by the German army. These machines are speedy and are built to carry pilot and passenger.







# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

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**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### Buffalo Model Aero Club

By CHRISTIAN WEYAND

Although in existence a very short time and considering that field meets have been held but bi-monthly, steady progress has been made by the club since its organization, June 30. Records are as follows:

Type model	Record	Date	By
Dur. H. L.	36 2/5 sec.	July 10	J. W. Schreier
Dist. H. L.	530 ft.	July 10	C. Weyand
Dur. H. L.	59 1/5 sec.	Sept. 4	Arthur A. Agthe
Dist. H. L.	805 ft.	Sept. 4	C. Weyand
Dist. H. L.	1004 ft.	Sept. 11	Arthur A. Agthe
Dur. H. L.	62 2/5 sec.	Sept. 11	Arthur A. Agthe
Dur. H. L.	70 sec.	Oct. 16	J. W. Schreier
Dist. H. L.	1625 ft.	Oct. 23	J. W. Schreier

The last record established was made at a recent field meet. A number of members attended, and the feature of the day was the persistent flying of Mr. Schreier's model. Despite the fact that a 25-mile wind prevailed, an average of 1209 ft. for five consecutive flights was attained.

Mr. W. H. Davis, formerly of the Canadian Model Yacht Club and now a member of the B. M. A. C., is working on a type of model, a sort of innovation, and it is expected that it will prove to be an efficient flyer.

At the last meeting Mr. Knut O. Kling, who is an enthusiastic model builder, was admitted as a member.

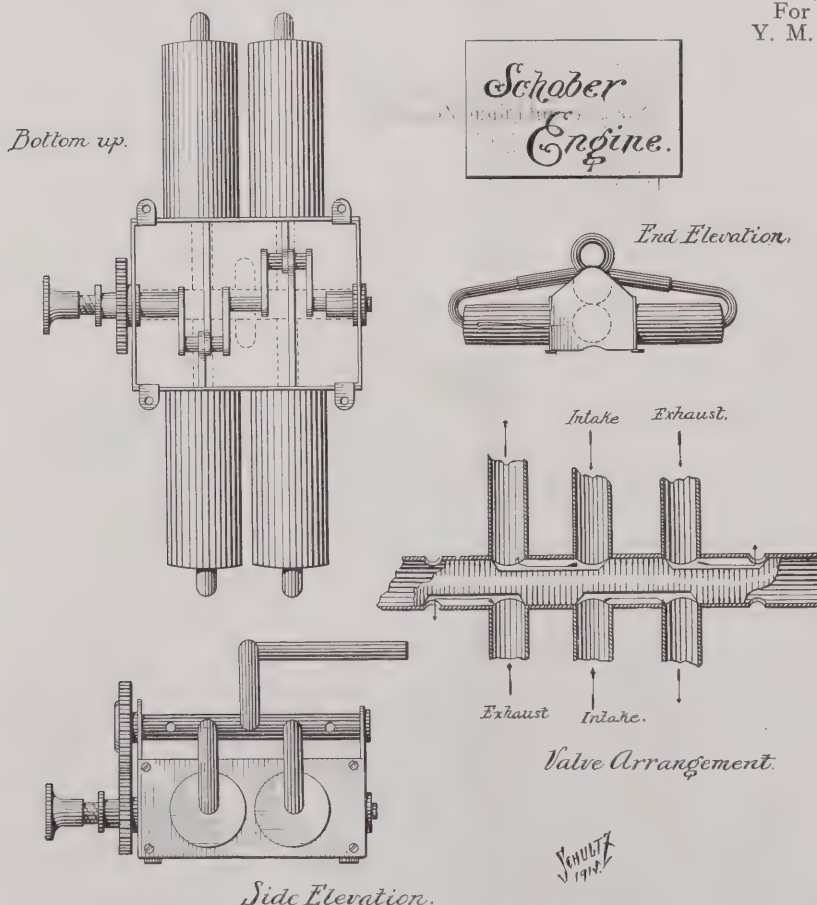
Model activities will be continued throughout the winter months and all local parties interested in this branch of aeronautics are requested to communicate with the Secretary, No. 48 Dodge St.

### Y. M. C. A. Model Committee

Plans are being elaborated for the stimulation of interest toward Model Aviation in the Oranges. Mr. R. M. Jacobus, Chairman of the Committee, is very actively engaged in arranging for exhibition of models in various stores in the Oranges. So far a number of stores have shown their willingness to exhibit models and more are expected to do likewise. Mr. Jacobus is also having slides made for use in the motion picture houses in the Oranges, which he believes will create considerable interest.

On invitation from Mr. Ralph E. Files, principal of the East Orange High School, Mr. G. A. Cavanagh, Secretary of the Aero Science Club and Model Editor of AERIAL AGE, will address the student body of that school on November 9th. The subject of the address will be "The Importance of Model Aeroplanes." Mr. Files, who is also a member of the Contest Committee, is interested in the advancement of the sport and has offered his assistance to that end. Prof. C. T. Schwarze, of Cooper Institute, who is a member of the Contest Committee, will be present during the address.

For further particulars address Mr. H. B. Grant, Secretary Y. M. C. A., Orange, N. J.



### The Schober Compressed Air Engine

With the possible exception of one or two enthusiasts, very little has been done in this country in regard to experimentation with compressed air as a power for flying models.

Among those who have experimented in this line, and have to some degree been more or less successful, are Messrs. Frank Schober, Rudolph Funk and John McMahon, of the Aero Science Club of America. These young men have practically given up the idea of using rubber strands as a power for models and have spent much time and energy in the construction of compressed air power plants.

The Schober engines have been very successful, a great deal of ingenuity being displayed by their creator in designing and building them, the workmanship being high class in every respect.

Mr. Schober's latest effort in this direction is depicted in the accompanying drawings, which show the four-cylinder opposed engine just completed by that constructor.

The crank case is constructed with four walls, of 24 gauge spring brass, and is substantially in the form of a rectangle, the top and bottom being left open. The front and rear walls have flanges which engage the inside of the side walls and are secured thereto by four small screws on each side, so that the crank case may be readily taken apart.

The four cylinders are made from drawn brass shells and have a bore 1/2" and stroke of 1/2". The pistons are made of solid red fibre.

The two-throw crankshaft is built up of steel with brass webs. The bearings are of steel.

The valves are overhead and are driven by a gear mounted on the end of the crankshaft, the gear driv-

(Continued on page 187)





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Thames River Anthology

High, high over the city,  
Silhouetted like a giant cremo against the night sky,  
A Zeppelin hovered a few nights ago,  
Flicking its deadly ashes upon the populace beneath.  
But a bare three miles from where I stood a bomb exploded.  
As the vile thing seared its ruddy way through the air  
The people ran scattering this way and that in an impulse of emotional fear.

Did I join the fleeing throng and seek the ready sanctuary of a basement?

Or did I remember in my hour of trial that I was a member of the Fox Meadow Club?

Sir, I did both.  
London, Oct. 2.

P. W.  
N. Y. Tribune.

#### The Flight Lieutenant

To fly tonight and keep my mind on it!  
To heed the call and leave her there with him—  
Strapped, helpless, in this flying frame to sit  
While they dance on until the stars grow dim.

I would have spoken when our own dear dance  
Was thrilling her, and she, within my arm,  
Was gliding to its rhythm. Now my chance  
Has gone to him, because of this alarm!

It's "Zeppelins near London"! So they've tried!  
I hope I get one 'ere this night is past—  
But, oh, to leave that fellow by her side,  
And take a flight that's apt to be my last!

Ah, well, God knows we're not in this for fun,  
And I must take my share with all the rest—  
I couldn't shirk and be my father's son,  
And Mother fed me England at her breast.

So here's for speed and speed, and then still more!  
The engine's fairly purring like a cat!  
At sixty, one jumps rivers, shore to shore,  
While towns and cities come and go like—that!

What's that black shape, there, racing in from sea?  
Ah, now I have him well against the sky!  
'Tis one of theirs and now it is for me  
To teach that German Captain how to fly!

Great heavens!! what a bulk he looms—and near!  
He's coming like a cloudbank in a gale!  
I'm mighty cold—it surely can't be fear?  
Well, if it is 'tis fear that I may fail!

I'd better ram! I'm well above him now,  
I'll drop upon him like a ton of lead  
And shear right through that gas bag like a plow,  
Well, one to fifty's not bad odds in dead!

And now to swoop! What's that?—a vivid spark!  
He's torn my planes to ribbons with a gun!  
Ah, God! I'm falling, falling through the dark—  
The German got me!—and that fellow's won!

O. C. A. CHILD.  
In the N. Y. Times.

#### Looks Down on It

The war aviator is not too proud to fight, though he is generally above fighting.

Edward Everett Hale's famous line, "Look up, not down," is said to be having quite a vogue just now in London.

#### Mental Looping-the-Loop

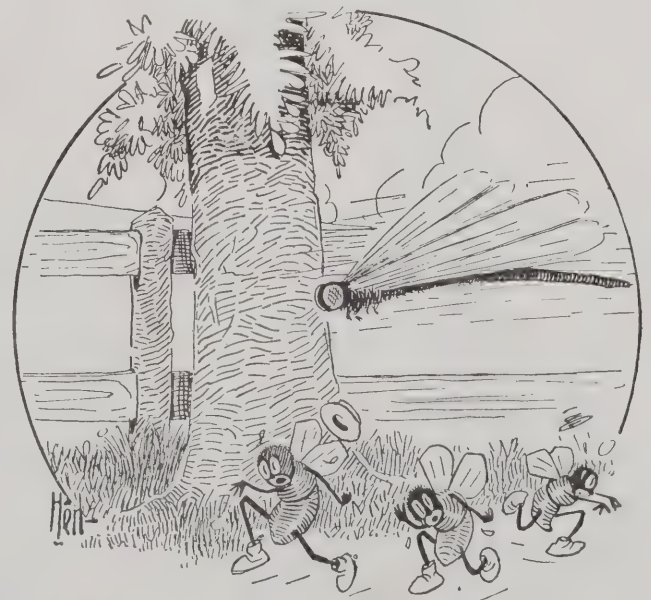
The hour of the paradox is with us. Conversationally it is all the thing. Recently we heard an educated professional man holding forth in an enraptured circle to the effect that interest in religion is a sign of decadence. Also, that the only way in which women can prove themselves deserving of the ballot is by first achieving some of the things which they are unable to do without the ballot. Thirdly, that the only true morality is complete lack of morals. Thus, by the simple process of the clown at the circus—to wit, by putting his head where his heels ought to be—one may establish a reputation for cleverness and originality. And, incidentally, he may save himself the trouble of doing any real thinking. One of the handiest little labor savers going is this here paradox.—*Collier's Weekly*.

It is understood that Count Zeppelin's favorite play is "When London Sleeps."

#### Not Wanted

"We can get along without your raid," as the Londoners said to the unbidden Zeppelin.

If Affila had had aeroplanes there would have been no Venice. But the fact can hardly be twisted into justification of an Austrian air carnival of destruction.



MR. BUG.—Cheese it, fellers! Zeppelins!  
Courtesy of Scribner's.



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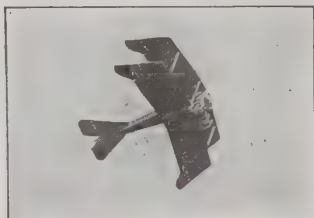
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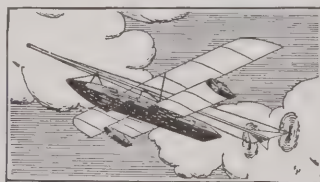
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(Continued from page 174)

behind the guns—the second line of the defense of the nation. He said that the First Battalion was very grateful to the Aero Club of America, and to Mr. Curtiss, and he hoped that this flying boat would be the forerunner of many others.

Gravely then the Governor's little daughter Olive, five years old, accepted a bottle of champagne, wrapped in silken folds, and while the guests gathered closer about the prow of the boat, and battalions of camera men clicked and ground their machines, the little lady vigorously thumped the bottle over the prow, once, twice, thrice—without effect. Lieut.-Commander Wait went to her assistance, and soon the contents of the bottle foamed over the prow of the flying boat while pretty little Miss Olive Whitman, whose pretty eyes outsparked the foaming wine, performed the baptismal rite with these words:

"I christen thee N. Y. N-1."

This was followed by an outburst of cheering, and while the military band played "America" and the crowd stood with bared heads, the plane was swung overboard with a derrick and made ready for its first official flight.

Ensign Lee H. Harris, at the pilot wheel, stood up, and, with one turn of the crank, set in motion the 100-h.p. engine, and Frank Burnside held the controls. The flying boat shot away over the surface of the river to the northward, wheeled gracefully and rose, spectre-like, in the teeth of the breeze, and disappeared in the direction of the Statue of Liberty. As the N. Y. N-1 repassed the pier, and the *Granite State*, with the Governor's pennant at her masthead, the band of the naval militia played the National Anthem, the closing bars of which found the N. Y. N-1 some two miles away to the southward and at an altitude of about 1,200 feet.

This first step toward giving aviation units to the militia was a complete success—to the great satisfaction of all, particularly those who contributed financially toward making this achievement.

As Mr. Emerson McMillin, the Wall street banker, who added 11 per cent. to sums raised by the National Aeroplane Fund, up to \$500,000, stated:

"It is a pleasure to contribute to a movement which does so much toward building our national defenses."

### Military Aviation News

On October 11, 1915, at about 11:15 a. m., First Lieutenant Walter R. Taliaferro, Aviation Section, Signal Corps, on duty at the Signal Corps Aviation School, was flying at an altitude of about 2,000 feet, when for some unknown cause the aeroplane fell into San Diego Bay, disappearing immediately. It rose to the surface for about a minute, but sank again before assistance could be gotten to it. Boats arrived from all directions, but the machine sank in about 52 feet of water. It was not until noon of the following day that the aeroplane and the body of Lieutenant Taliaferro were recovered, although search was continued without cessation. What caused this accident will never be known, and it is axiomatic that, in an aeroplane fall unless the pilot lives to tell his story, it is impossible to say what the trouble may have been.

Lieutenant Taliaferro had been on aviation duty since March, 1913, and his work and energy greatly contributed to the success attained by the army in flying. He had been officer in charge of training at the Signal Corps Aviation School for the past year, and under him every aviation student who has qualified as junior military aviator within that period has been trained. His knowledge of cross-country flying was of the very highest order. He was the holder of the American endurance record for sensational flight, and he was admitted by all as being the topnotch of aviation circles. The death of Lieutenant Taliaferro in an aeroplane accident serves but to impress upon all the fact that the lives of the most skillful aerial pilots and the loss of the best machinery are demanded in order that the wheels of progress may turn toward greater achievements.

Lieutenant Taliaferro was buried in San Diego on October 16. He was accorded a military funeral, all the honor due being rendered. His home, the church and the grave were a mass of flowers sent by friends as their last token. The city of San Diego seemed to mourn the loss of this splendid officer, and appeared to realize that one more life had been sacrificed in time of peace while preparing for the future emergencies that may arise in the defense of the country.

The sounding of taps over the last resting place of Lieutenant Taliaferro in the Masonic Cemetery closed a career of extraordinary promise. American military aviation has a roll of honor of eighteen dead. Lieutenant Taliaferro was in the front rank of the nation's flyers, and in addition, possessed that combination of ability and experience which made him an ideal instructor, a position very difficult to fill.



Characteristic of his indomitable spirit was his flight of nine hours and forty-eight minutes on September 17, last, when he established a new American endurance record under very trying conditions, the flight ending only upon the complete exhaustion of his fuel supply. That one of such high qualities should not survive to serve longer in his chosen profession is indeed a tragedy. His death occasioned universal sorrow at the aviation school. The question of one of his comrades, "How can we replace him?" is surely a most fitting tribute. Could any one wish a finer epitaph?

Deep sympathy is extended to his widow, to whom he was married in San Diego on the 29th of last April, and to the other members of his family.

#### The American Aviators in France

A circular issued by the Franco-American Flying Corps from its headquarters in Paris officially declares that the object of the Corps is to assist France and to train young Americans in this branch of warfare so that they may be of service to their own country in case of need.

"What was the spirit that moves these young American citizens to cross the ocean and volunteer as French aviators?" asks the pamphlet. "As one of them said: 'We wished to return the compliment which Lafayette and Rochambeau paid to us. We wanted to belong to that fine and sportsman-like institution, the French Aviation Corps, and we felt that Americans ought to help a republic that was in a conflict where the liberty of all nations was at stake.'"

There are now twelve American aviators at the front and eleven are in training.

The first American volunteers were Elliot Cowdin, James J. Bach, Frazier Curtis, H. G. Gerin, Bert Hall, D. G. Masson, Norman Prince, Andrew Ruel and William Thaw. They were trained in one of the first aviation schools in France, that at Pau.

#### Three Submarines Destroyed by the "America"

The giant flyer, the "America," built in this country under the patronage of Rodman Wanamaker and in which Commander J. C. Porte, then a lieutenant in the British Army, was going to fly across the Atlantic when the war broke out, is doing effective work for the English.

According to information received by Henry Woodhouse, governor of the Aero Club of America, the big airship recently put out of commission three German submarines. One of these was blown up with bombs dropped from the "America." The other two lost their periscopes through the fire of the airship and were in consequence forced to come to the surface, where waiting destroyers quickly got them and their crews.

(Continued from page 184)

ing the valve shaft by means of a gear on that shaft with which the crankshaft gear meshes. The valve arrangement is shown in the drawings, and consists of four recesses cut into the valve shaft, two of which allow the air to pass from the inlet pipes, which lead into the valve chamber at the center of the same, to two of the cylinders at once, while the other two recesses allow the exhaust to pass from openings in the sides of the valve chamber.

The cylinders are secured to the side plates of the crank case, so that when those side plates are removed, the cylinders are removed with them. The pipes are detachable at their centers, small pipes running to the heads of the cylinders extending into larger pipes which run to the valve chamber. This arrangement is shown in the end view of the engine.

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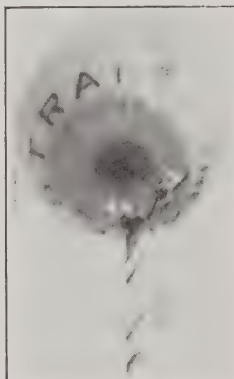
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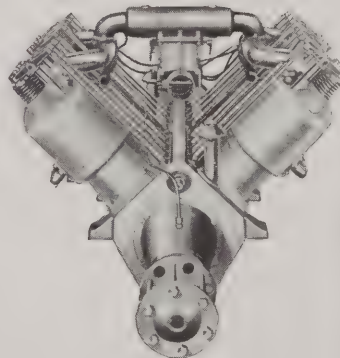
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Vol. II

NEW YORK, November 15, 1915

No. 9

### Flying as a Sport

**W**HAT have we in the marine aeroplane? At its very birth it was a craft capable of carrying two or more at a speed of sixty miles an hour with an expenditure of power, and consequently a cost of manufacture and a cost of upkeep, of one quarter that of the fastest motor boats.

Marine flying is but three years old, and yet we have seen sportsmen in considerable numbers adopt it with keen delight, both in this country and abroad. In this country, lakes have been traversed, rivers and coasts have been the scenes of memorable achievements; and, better than this, the safety of the new machines has been demonstrated without doubt.

The world is realizing that a step has been made which will permit of faster travel over water with safety; and engineers who have carefully studied the new field feel safe in stating that traveling speeds of at least 100 miles an hour are feasible at present and entirely within the limitations of the art as it is known now.

We may look forward with certainty, therefore, to such accomplishments as traveling from Key West to Havana in about an hour, from Chicago to Milwaukee in an hour, from Newport to New York in an hour and a half, and across the Atlantic in a day.

Not all of the development work in this country has by any means come to the knowledge of the general public. Many concerns, knowing the tremendous future of this new field, have been quietly at work for years to develop their ideas on a solid basis, and revolutionary progress may be anticipated during the next year.

Such well-known sportsmen as Vincent Astor, Harry Payne Whitney, Robert Glendinning, Harold G. McCormick and Robert J. Collier are using water-planes for aerial touring. Aero yachts are now being designed for several sportsmen that will be capable of carrying six people on trips of a thousand miles at a speed of almost a hundred miles an hour—aero yachts having enclosed cabins for the protection of their passengers from the elements and affording them many of the conveniences that are found on the average yacht.

Progress in America in water flying has far outstripped the rest of the world, and from all indications we are destined to keep that lead—and especially in water flying as a sport.

### Aero Club of America Begins New Year Auspiciously

**T**HE Aero Club of America has begun a new year—most auspiciously. As we look back and consider the tremendous amount of work done in the past year and we read the resolutions adopted at the annual meeting which opens the club's new year, we must express admiration for this highly patriotic and public spirited organization. To repeat the words of an editorial of a leading New York daily and express a sentiment which has been expressed by the Press all over the United States, "The Aero Club of America deserves great praise."

The annual meeting of the Aero Club of America was held Nov. 8th at the Club House, and besides electing new officers and attending to the routine business, there were many things of exceptional interest, as follows:

On motion of Mr. Alan R. Hawley a resolution indorsing the establishing of the Naval Research and Experimental Laboratory, recommended by the new Naval Consulting Board of the United States, of which Mr. Thomas A. Edison is Chairman, was adopted.

In proposing this resolution, Mr. Hawley spoke of the patriotism and public-spiritedness of the 24 members of the board, who, having extensive interests and consequently being always pressed for time in which to attend to the many things connected with their various interests, now offered to give their time and energy to their country free of charge, even paying their expenses in connection with the work of the Board.

Mr. Hawley then dwelt upon the fact that such a laboratory, the construction of which has been estimated at only \$5,000,000, and the operating cost at but \$3,000,000 a year, would be of inestimable value to the country. This laboratory, he said, could do much toward advancing aeronautics in America. Mr. Hawley also brought out the fact that for the past six months the motor makers of America had been troubled by lack of material having the qualities of Krupp steel, and also because of lack of magnetos and inability to obtain certain parts that heretofore had been obtained from Germany.

On motion of Mr. Robert J. Collier, it was resolved that the Aero Club of America indorse the demand made on the administration by the defense movement to provide for restoring America to the second position among the navies of the world. Every consideration of its security demands that this shall be done at once, and the people will be satisfied with nothing less.

The naval program submitted by Secretary Daniels provides for only a small annual increase for five years, an increase insufficient to fill even the most immediate needs, and which is far from being a step toward restoring America to the position of second naval power.

On motion of Mr. Henry Woodhouse it was resolved to urge the Administration to provide for the organization of aviation corps in connection with the National Guard and Naval Militia of the States. In proposing this resolution, Mr. Woodhouse pointed out that America needs 2,000 aeroplanes.

**AMERICA MUST BE RESTORED TO THE POSITION OF SECOND NAVAL POWER.  
EVERY CONSIDERATION OF ITS SECURITY DEMANDS THIS SHALL BE DONE AT ONCE.  
THE PEOPLE WILL BE SATISFIED WITH NOTHING LESS.**



As a matter of fact, he said, the Army and Navy combined have less than 20, and the provision for aeronautics in the Army and Navy estimates for next year are only about one-fourth the size they should be in order to enable the Army and Navy to establish aviation stations in different parts of the United States, the Philippines, Hawaiian Islands, and Panama.

At present, Mr. Woodhouse said, the Army and Navy each have one small aviation station, and there are no stations or aeroplanes in our island possessions. The Army and Navy bills do not provide for the development of aviation corps or for supplying aeroplanes to the National Guard and Naval Militia. This, he said, is a serious matter that the next Congress should not fail to provide for.

On motion of Mr. Charles Jerome Edwards, it was voted to elect to Honorary Membership in the club Mr. Alberto Santos-Dumont, the Brazilian pioneer in aeronautics.

On motion of Mr. Henry A. Wise Wood, it was resolved that the Aero Club of America concentrate its efforts to establish a chain of Aero Radio stations at intervals of 100 miles on the Atlantic, Gulf and Pacific Coasts. Mr. Wise Wood pointed out that an aeroplane equipped with wireless, reporting every hour to a base on shore, could patrol a circle 100 miles in diameter and that 34 machines and shore stations could successfully protect this nation against surprise.

Mr. Wood then pointed out that had such a chain of Aero-Radio stations been in operation on the coast of Ireland, the Lusitania could have been warned and thus saved.

Major F. L. V. Hoppin, Chairman of the Membership Committee, announced that 110 new members had been elected to membership in the club, making a total for the fiscal year of 567. Of these 27 are life members.

The following officers for the next year were elected: President, Alan R. Hawley; First Vice-President, Henry A. Wise Wood; Second Vice-President, Cortlandt F. Bishop; Third Vice-President, Chas. Jerome Edwards; Fourth Vice-President, Albert Bond Lambert; Secretary, Howard Huntington; Treasurer, James H. Perkins.

Mr. George M. Myers, Chairman of the Affiliated Clubs Committee, reported that two new organizations had recently become affiliated with the Aero Club of America, viz.: the Aero Club of the Northwest, at Seattle, and the Wichita Aero Club, of Kansas. This makes a total of twenty-six clubs that are affiliated with the parent body.

The governors elected at the annual meeting were as follows:

Class A, term expiring 1919: Robert J. Collier, W. Redmond Cross, Major F. L. V. Hoppin and W. W. Miller.

Class B: Henry B. Joy, John Hays Hammond, Jr., Albert B. Lambert, Harold F. McCormick, George M. Myers, Samuel Reber, Dr. A. F. Zahm and Rodman Wanamaker.

The Board of Governors of the Aero Club of America is now composed of the following:

Robert J. Collier, W. Redmond Cross, F. L. V. Hoppin, W. W. Miller, James A. Blair, Jr., Henry Woodhouse, Allan A. Ryan, Evert Jansen Wendell, Cortlandt F. Bishop, Alan R. Hawley, Henry B. Joy, Samuel H. Valentine, Henry A. Wise Wood, J. Stuart Blackton, Chas. Jerome Edwards, Cornelius Vanderbilt, William F. Whitehouse, John Hays Hammond, Jr., Albert B. Lambert, Harold F. McCormick, George M. Myers, Samuel Reber, Dr. A. F. Zahm and Rodman Wanamaker.

#### Flight from the Deck of a Ship

REAL and considerable importance must be ascribed to the successful launching last week from the cruiser North Carolina, and while that vessel was moving at full speed, of an aeroplane carrying one of the naval aviators. This means, of course, that hereafter flying machines can, which is much the same thing as saying will, play in sea warfare the large part they already play in that of the land. They may, indeed, do in the new field even more than in the old, for when the commander of a warship, or a fleet of them, can send a number of observers several thousand feet up into the air, his radius of vision will in effect be increased so as to cover circles of a hundred miles or more in diameter, and hiding behind a horizon only fifteen or twenty miles away will no longer be possible. Naturally, that commander's antagonist will utilize the same power, and thus the

whole system of naval tactics and strategy will again be as thoroughly revolutionized as it was when steam replaced sails.

It is not stated that the new device enabled an aeroplane to alight on the North Carolina's deck as well as to rise from it, and, as a matter of fact, that has not yet been accomplished. Whether it will be or not remains to be seen. The difficulties in the way are great, but not insuperable—what difficulties are, for modern science?—and meanwhile it will be easy enough to pick up a returning hydroplane in any except seas immoderately heavy.

Some attention is deserved, especially at this time, by the fact that the achievement now announced by the Navy authorities in evident appreciation of its value is the outcome of experimental work started and carried almost to completion by Captain W. I. Chambers, who, in spite of the ingenuity and industry shown by him in adapting aviation to naval needs, was retired by the now abolished "plucking board." This was done in spite of his earnest protests, and, that officer's friends have persistently claimed, not only without reason, but against reason, unless it be a reason that the board had to retire more men than those against whom they could prove some sort of incapacity.—*N. Y. Times.*

#### Air Craft in War

(Editorial from Boston Advertiser.)

THE importance which air craft have assumed in the war across the seas is too commonly known to need any further comment. And it does seem strange that the importance of this branch of modern defense is not yet more fully appreciated by those who have charge of our national program of defense. Word has come from Washington that the recommendations of the experts to Secretary Daniels have promptly been cut down by him to less than half of what they considered vitally necessary. If the government "stands ready to spend \$500,000,000 on national preparedness," as is now stated, one might naturally suppose that it would be willing to allow at least five per cent. of that amount, say, for building up so important an arm of the service as the air fleets; but of course the government has no idea of spending \$500,000,000 additional, this year, on preparedness. If it ever does, according to the administration's program, that additional expenditure is to be spread over a good many years to come. While unwilling to spend much, now, the administration is cheerfully willing that some future administration shall do so.

#### Public Help for Air Craft

(Editorial in N. Y. Tribune.)

THE recent presentation by Glenn H. Curtiss of a flying boat to the Naval Militia of New York, so that the State's naval arm shall not be without air scouts, marked an epoch in the country's attitude toward its defenses. It was the first tangible result of the American citizen's feeling that the salvation of the nation from a state of military and naval imbecility must be worked out by the vast body of awakened Americans.

The million dollar appropriation granted to the Navy for aeronautics last year has been sunk with little or nothing to show for it. It was not a drop in the bucket. Yet the same lawmakers and defense autocrats this year propose a naval aviation budget far below the necessary appropriation to give aerial "eyes" to our already ailing fleet.

The Aero Club of America deserves great praise for its efforts to supply the National Guard and Naval Militia of the various States with air craft through popular subscription. The great air fleets of France and Germany were made possible in that way.

Although popular subscription cannot build a navy or create an army, despite the noble and successful efforts of Swedish women in this country to supply their native land with a

battleship, yet popular subscription can do much in the formation and equipment of an adequate air service. More important than any other bearing the Aero Club's campaign may have on the national defense situation, however, is the realization which it will bring to America of our infant air service and the determination which it must instill in the average voter to put his voice and his vote where they will count most for national preparedness.



The representative gathering at the christening of the first flying boat of the New York Naval Militia.



# THE NEWS OF THE WEEK

## Navy Flier Up 11,000 Feet

A new altitude record for United States Navy airmen was established November 4th at the Navy Aero Station at Pensacola, by Lieutenant R. C. Saufley, who ascended to a height of 11,000 feet, using a Curtiss hydroaeroplane. The ascent was made in 40 minutes and the descent in 15 minutes. The previous record for altitude at the navy flying school was held by Lieutenant D. N. L. Bellinger, who has a record of 10,000 feet.

## Navy Seaplane Launched from Moving Warship

The aeroplane launching device, which has been under test at the aeronautic station at Pensacola, has been installed on the cruiser North Carolina, and recently an aeroplane was successfully launched from this device while the North Carolina was under way.

It was the first time an aeroplane ever had been launched from a ship under way, and represented the culmination of a series of experiments which started in 1912. The launching device, or catapult, was first suggested and tried out by Captain W. I. Chambers, U. S. N., who was then in charge of aviation. The first device was made and tested at the Washington Navy Yard, but was purely experimental and rather crudely built, simply to demonstrate the principle.

Two successful flights were made from this launching device. A new and improved device was constructed and shipped to the aeronautic station at Pensacola, where it was installed on a barge and put through a complete series of tests before being placed aboard the North Carolina. Several successful flights by different aviators were made. The flight from the North Carolina was made in navy aeroplane AB-2, with Lieutenant Commander H. C. Mustin as pilot.

The launching device is in the form of a car propelled along a track, the aeroplane being secured to the car until it reaches the end of the track. When the car stops the aeroplane is released and proceeds under its own power in flight. The aeroplane is landed on the car, fastened in place and the motor started. The aviator takes his place in the aeroplane, and when all is ready the car is propelled along the track at a gradually increasing speed up to about fifty miles an hour, when the car is brought to a standstill and the aeroplane released.

## Naval Advisory Board Selects Its Committees

At a meeting of the Naval Advisory Board to divide its work and select committees to have charge of the various divisions of the Board's activities, Henry A. Wise Wood, of New York, was chosen chairman of the Committee on Aeronautics (including aero motors). The other members of this committee are: Howard E. Coffin, P. C. Hewitt, Andrew L. Riker, M. B. Sellers, E. A. Sperry, and A. G. Webster.

Mr. Wise Wood is also a member of the Committees on Ordnance and Explosives, Transportation, Ship Construction, and Aids to Navigation.

Elmer A. Sperry was chosen chairman of the Committee on Mines and Torpedoes, and the other members of this committee are L. H. Baekeland, M. R. Hutchinson, and Hudson Maxim.

Mr. Sperry is also a member of the Committees on Aeronautics, Internal Combustion Motors, and Aids to Navigation.

## Robert Glendinning's Generous Offer

Mr. Robert Glendinning, of the Aero Club of Pennsylvania, has offered his balloon of 38,000 cubic feet capacity to the club for use by the National Guard of Pennsylvania Signal Corps in field work. This balloon has a carrying capacity of four passengers and is fully equipped with instruments for observation work. It is of great value in directing the work of artillery in range finding and for general observation.

## Affiliation of the Aero Club of the Northwest

The Aero Club of the Northwest, which has its main office at 1100 Hoge Building, Seattle, Washington, has become affiliated with the Aero Club of America. The Aero Club of the Northwest has four honorary, fourteen resident and five army and navy members. The officers of the club are: President, William E. Boeing; First Vice-President, Captain Robert E. Coontz, U. S. N.; Second Vice-President, Mrs. Harry Whitney Treat; Third Vice-President, Prescott Oakes; Secretary, Naval Constructor G. C. Westervelt, U. S. N.; Treasurer, Edgar N. Gott. The colors adopted are bronze-green and black, and the insignia borne by the club flag is an outer circle of bronze-green, an inner circle of black with a white interior field carrying a mallard drake in full flight.

## Britain Has 1000 Pilots

Among the passengers arriving on the *Baltic* was Lieut. P. S. H. Arbon, of the British Army Aviation Corps. He met with an accident at Hendon and is here on a brief leave of absence. Interviewed by a representative of AERIAL AGE he said that a great deal has been accomplished in aviation by the British Government since August, 1914. "At that time," he said, "there were only 300 pilots altogether. Now, without counting the number killed and wounded, there are 500 pilots in the Navy and 500 in the Army, and when I left France we were forming our twenty-third aviation squadron for the Army. There are forty pilots in each squadron, and each pilot has three machines and three mechanics to a machine. John C. Porte is now the commander of the North Sea squadron of aeroplanes."

When asked about the attacks on German cities by the aircraft of the Allies, Lieutenant Arbon said one reason why none had been made recently was that the Germans had invented a new anti-aircraft gun, which had an accurate range of over 10,000 feet.

He said that Claude Grahame-White had resigned from the Naval Aviation Corps and was now making aeroplanes for the Government at his own factory at Hendon.

The lieutenant has come over to inspect some machines that are being constructed in this country and Canada and expects to be here two or three weeks.



Ensign Lee H. Harris cranking the motor preparatory to making a flight on the "N. Y. N. 1" of the New York Naval Militia.





Oscar A. Brindley, who piloted the Hall-Scott engined Martin hydroaeroplane to success in the Curtiss Marine Flying Trophy Contest.

#### Power of Curtiss Motors

In view of recent comments in a Southern publication regarding the under-rating of American-made aeronautical motors, it is extremely interesting to look over the test charts showing the actual power curve of the Standard Curtiss motors. *Aerial Age* has secured these sheets and in next week's issue will publish them, showing the actual power developed by the Curtiss Model V-2 motor, rated at 160 h.p.

This engine is of the 8-cylinder V type with 5-inch bore and 7-inch stroke. It actually develops better than 170 h.p. Steel cylinders, double ignition through two independently driven systems and double carburetion insure the utmost reliability and durability.

More than 12 years of practical experience in the building of aeronautical motors is back of the engineering department of the Curtiss Motor Co. It is an interesting fact that Charles M. Manley, pioneer aeronautical engineer, who built the original motor for Prof. Langley's aerodrome, the first flying machine built, is the chief consulting engineer at the huge Curtiss plant in Buffalo, and Charles Kirkham, whose aeronautical motor experience dates back to the early days of American aeronautics, is the chief designing engineer.

#### Curtiss Openings for Technical Men

In accordance with a plan to get one man from each of the best technical schools of the country, the Curtiss Aeroplane Co. has written to the Ohio State University for one of its best last year's graduates in the department of engineering to take up aeronautic work with the company. The faculty announced that this man would be chosen at its next meeting.

#### New Jersey Naval Reserve Organizes Aviation Section

A recent step forward toward the development of preparation for adequate aerial defense of this country is the activity shown by the First Battalion Naval Reserve of New Jersey in the establishing of an aeronautic section of that organization.

While there is no immediate prospect of securing an aeroplane from the government, since it is reported that there is less than twenty in both army and navy combined, it is believed that the lack of trained aeronautic organizations in connection with our national defenses is such a serious matter, in light of the vast importance of the parts played by air-craft in the European War, that it is the particular duty of military organizations to proceed without delay to establish such aeronautic corps as may best co-operate with their respective units, even though equipment has to be secured by private subscription.

It has been due to the vigorous efforts of the Aero Club of America in arousing public sentiment to the need of adequate aerial preparation by this country that so many public spirited men and women have come forth with financial support for obtaining aeronautic equipment.

New Jersey has long had strong sentiment for national defense, and is particularly interested in the development of strong aeronautic forces, as it is conceded by naval and military strategists that New Jersey, with its miles of even coast line, would be one of the probable points of an attack in a campaign against the eastern portion of this country.

Not only would a foreign foe have a fair opportunity of landing forces on New Jersey soil, but with a landing secured, this foe would have the American forces guessing as to whether it would strike northward toward New York and New England or whether southward toward Philadelphia, Baltimore and Washington. A large number of chemical plants and munition factories are located in the vicinity of the eastern coast which, were they captured, would be of great value to the invading army and would further make New Jersey a tempting point for initial attack.

With these realizations New Jersey military organizations have been steadily increasing in efficiency in recent years in order that, should a time of strife come, New Jersey, as in the past, will not be found wanting.

Already there are more applicants for the aeronautics corps of the First Battalion Naval Reserve than can be accommodated, but only men who have a fair education and have mechanical ability are being selected, that the work of instruction may proceed as rapidly as possible. There is still room for a few such men, and as soon as these are obtained the work of instruction will proceed immediately.

The aeronautic section is in the charge of J. Homer Stover, of Trenton, N. J., who was chosen ensign at a recent election of the battalion, Ensign-elect Stover being assigned to the duty of organizing the section by Commander Edward McC. Peters, commanding officer of the battalion.

Ensign-elect Stover is a chemical engineer and was one of the founders of the Princeton University Aero Club in 1909. Any communications in reference to the section should be addressed to him, U. S. S. Adams, foot 12th street, Hoboken, N. J.



The hydroaeroplane with which Allan Haines Longhead is carrying passengers daily at San Francisco.



### First Aerial Coast Patrol To Be Established in Maine

The campaign for the establishment of an Aerial Patrol Station in Casco Bay was most successfully inaugurated at a dinner held under the auspices of the Portland Chamber of Commerce at the Falmouth Hotel, November 5th.

Mr. Henry A. Wise Wood, Mr. Elmer A. Sperry and Mr. Henry Woodhouse represented the Aero Club of America, and announced that the club would add 10 per cent to all sums raised up to February 1, for the construction of the proposed station.

Mr. Greeley S. Curtis, of the Burgess Company, at Marblehead, stated that his firm would instruct two aviators at its school free of charge and would build a hydroaeroplane of the latest type, at practically cost.

The meeting was highly successful from every standpoint and the 150 representative citizens of Maine, who were present, were very enthusiastic over the proposition and the general sentiment seemed to be that there would be no great difficulty in raising the necessary funds. The result of the affair was the appointment of a committee, which will push the matter to completion.

Rear Admiral Robert E. Peary, who first proposed the plan for an Aerial Patrol Station in Casco Bay, was present and explained in detail the plan. He said in part:

"An aerial coast patrol system, in other words a patrol of the coast by aeroplanes, is a vital feature of our national defense, in regard to which there is no division of opinion.

"The sub-division of the system into sections of convenient radius, brings the expense of each section within the means of each community.

"The idea itself in briefest terms is the division of our entire coast from Eastport to the Rio Grande, and from San Diego to Puget Sound, into convenient section of 'beats,' each beat in time of emergency to be patrolled continuously by a powerful hydroaeroplane with driver and observer, equipped with wireless.

"Such a machine driving along its section at a distance of 50 to 60 miles from the coast can detect the approach of an enemy's ships miles further out, and by means of the wireless, convey information as to their number, character and course, to the shore stations, thus giving several hours' advance notice to prepare for attack.

"When the system is in operation there will be far out at sea a continuous cordon of whirling shuttles, the eyes of the nation, ceaselessly weaving their curtain of protection round the entire country.

"With such a system in operation a surprise attack upon our coasts will be an impossibility.

"The idea is to get the sections of this system established by private initiative, and later they can be either taken over by, or co-ordinated with the government.



The new Robinson "Scout" built by the Grinnell Aeroplane Co.

"The immediate result will be the acquisition of a considerable number of hydro-aeroplanes, available for government use, without burden to the government; and a material increase in the number of aviators available for government service, also without burden to the government.

"What we are now trying to do is to establish the first station of this system here in Casco Bay at the eastern extremity of our coast line.

"It is believed that this Maine station, the first of its kind, can be made a model and pattern, and that the success of this effort to install it will prove such a powerful stimulus and exert such a controlling influence as to result in the establishment of a continuous series of stations by the various committees along our coasts until the entire coast line from here to Puget Sound is covered and protected."

Mr. Wood and Mr. Sperry subsequently addressed the meeting and pointed out the vital necessity of Aerial Coast Patrol. Senator Charles F. Johnson and Congressman Daniel J. McGillicuddy spoke on national defense.

Mr. Greeley S. Curtis on October 28, 1915, celebrated his 20th anniversary of his first gliding flight with Lilienthal.

### Martin Hydroaeroplane Success in East India

One of the military hydroaeroplanes manufactured at the Glenn L. Martin plant for the Netherlands East India army has been tried out with complete success, says a Havas despatch from Batavia, Java, capital of the Dutch East Indies.



The "N. Y. N. 1"—the flying boat presented to the Naval Militia by Glenn H. Curtiss—being towed to clear water on the Hudson for a flight. The flying boat will be on exhibition at the Military and Athletic Exhibition in Madison Square Garden this week.





## Activities at Sheepshead Bay Speedway

The fact that thirty thousand people attended the combined motor races and aviation exhibition at Sheepshead Bay on election day augurs well for the weekly aviation meetings which are to be held at Sheepshead Bay Speedway beginning May 15.

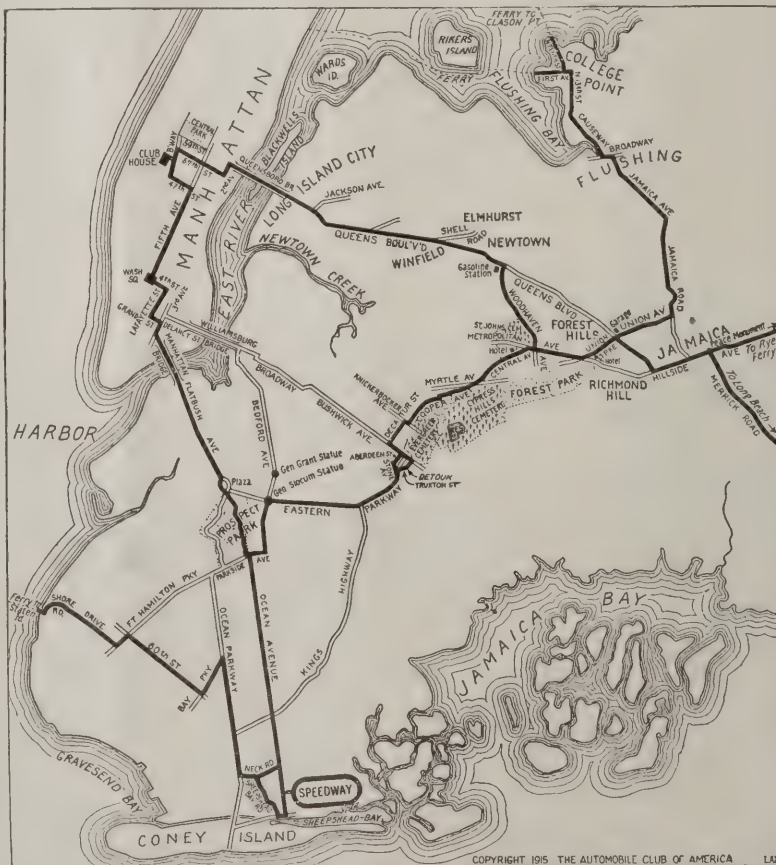
The races for the Astor Cup on Oct. 9 were attended by one hundred thousand people, which demonstrates that in the fair and warmer weather of Spring, Summer and Fall a large attendance may be expected at any open air events held on a large scale, such as will be held at Sheepshead Bay Speedway.

That there should be a great aviation centre at the gates of the nation is self-evident, a station where weekly flying meets can be held and where aviators can be trained, and to meet this need the Aero Club of America has arranged with the officials of the Sheepshead Speedway to make Sheepshead Bay an aviation centre. Plans are already under way toward the actual establishment of the aviation centre. A row of concrete hangars, between 60 and 100 feet in size, each provided with steam heat, electric lights and all conveniences necessary to make them comfortable for continuous tenancy will be erected, and beginning in the spring meets will be held every Saturday. There will be training schools in operation also and with facilities for carrying passengers at any and all times. Thus it will be possible for anyone interested in aviation to at any time go to Sheepshead Bay for instruction, or for flights. In other words, Sheepshead Bay is to be to New York what Hendon is to London and to England.

By the establishment of an aviation station at Hendon, in the outskirts of London, at a time when interest in aeronautics in Great Britain was as backward as it is here in the United States at present, Claude Grahame-White not only popularized aviation, but he created an institution which has been of inestimable benefit to England since the outbreak of the war. For through it many aviators were at hand to guard London against the aerial attacks of the enemy and the schools there were available to undertake the training of additional aviators whose services the government badly needed. Since the beginning of the war there have been on an average 50 pupils in training at Hendon each day. So Sheepshead Bay will not only provide something which this great city needs in the way of amusement, instruction and diversion for its residents and the thousands of visitors, but it will serve an important commercial and patriotic purpose. It will give this country many additional aviators, and will be an added measure of security to the city and to the nation.

Besides the hangars already mentioned there will be erected between these structures other buildings for the use of motor and accessory concerns and for office purposes.

Sheepshead Bay is, as the accompanying map indicates, so conveniently and easily reached that there is every reason to believe that the public will be glad to avail itself of the weekly opportunity to follow the fascinating sport. On the other hand, the great future of aeronautics is so apparent that, with schools so conveniently located, large numbers of young men will eagerly take advantage of the chances that they afford for entering upon a career in the new industry.



Map showing the location of the Speedway. It is right across Brooklyn, only 10 cents' fare from the heart of New York City. Next Spring the new subway will stop at the very gates of the Speedway. This nearness to New York City and Brooklyn will insure large attendance to the weekly aviation events.





# FOREIGN NEWS



## BELGIUM

Word has just been received here that Prince Leopold, heir to the Belgian throne, who is now at Eton, was in London the evening of the big Zeppelin raid and was slightly injured.

Prince Leopold was proceeding to the theater when the bombs began to fall. One exploded within about sixty yards of his party. Prince Leopold was knocked down by the force of the explosion and his arm was cut by a piece of the bomb.

## FRANCE

American airmen with the French Army have discovered a new way to irritate the Germans and to express their contempt for German anti-aircraft gunners. When they come into range over the German lines they loop loops at high speed, indicating ease of mind and defiance. In aviation circles looping—"clowning"—the airmen call it—is considered the last word in insult, which the Germans appear to realize, as they invariably greet the performance with redoubled fire. Asked the height of effective range of the German guns, one of the Americans replied:

"I don't yet know. I have never been high enough to get out of range. Last week one of their shells burst 500 meters above me when I was 4,000 meters up."

The same informant declared that aviators were regarded as pariahs by all the German Army except the air service, whose members were always friendly and carried back news of any one captured, as the French did for them.

The latest French aircraft have a speed of over 105 miles an hour. The Amsterdam Telegraaf states that on November 3 a French aviator flew over Mechlen and Liege and bombarded a German munition depot. Three other aviators bombarded German defense works on the Franco-Belgian frontier.

Two military aeroplanes collided while making a landing November 2 at Le Bourget. They caught fire, and the four aviators manning the machines were burned to death.

The poisonous gas factory at Dornach, Alsace, which was attacked November 6th by French aviators, was virtually destroyed, according to a report from Basel. The manager and forty-two workmen are said to have been suffocated, while other employees were overcome and sent to hospitals.

The officials of the new French Advisory Committee for Military Aeronautics have been appointed as follows: President, M. Rene Bisnard (under Secretary of State for Military Aeronautics); Vice-Presidents, M. Appel and M. R. Esnault Pelterie (President of the Association of Aeronautical Industries); General Secretary, Lieut. Col. Mayer (Chief of Staff of the Under Secretary of State for Military Aeronautics); Assistant Secretaries, M. M. Granet (Sec. A. Ac. I.) Cezanne, Besancon (Sec. Ac. C. F.) and Capt. Estirac.

## GERMANY

Her submarine campaign having failed, Germany has called on her air fleet to cripple British shipping, according to the Liverpool Journal of Commerce, which reports an attack by three aeroplanes on the steamship Avocet, which has arrived at Manchester. For thirty-five minutes the aircraft—one of them a large battleplane—flew above the vessel dropping bombs, some of which missed hitting the decks by a few feet. When the supply of bombs ran out the battleplane turned a machine gun on the Avocet and her decks and sides were struck many times, but the crew escaped injury.

Battles in the air were very frequent in the Tahure region during the past week. Several aerial duels, says Berlin, took place near Belfort, with the advantage resting with the Germans. South of Tahure a German aviator brought down his sixth enemy aeroplane.

In a dispatch to the N. Y. American, Mr. C. F. Steward writes as follows:

"I learn from a neutral traveler that activity at the various Zeppelin centers is now greater than at any previous period of the war. At Berlin new sheds are being erected while at Friedrichshaven, Hamburg

and Wilhelmshaven all work is being pushed forward with feverish haste. The chief aim is to get at England, but the Germans claim that both in the North Sea and in the Baltic the scouting work of the airships has been invaluable. They believe that in good weather it is impossible for hostile craft, either battleships or submarines, to approach Germany without due warning. They claim to have sunk Russian submarines and harried British merchant shipping. The Germans are convinced that they did more damage in London than is admitted, and they hope to do a great deal more. They are building new airships of great speed especially for work over England."

The following is the German official report on the Zeppelin raid on London October 13, 14.

The East India Docks were attacked and a large shed full of ammunition was burned to the ground. At the London Docks warehouse was destroyed and several ships hit by bombs and some destroyed. At Victoria Docks a large cotton warehouse was burned to the ground. In the same neighborhood blocks of houses were destroyed or damaged in St. George Street and Leman Street. The city, and particularly the newspaper quarter, was bombarded with especially good success. The Tower of London and London Bridge, which were armed with guns, were bombarded.

The London and Southwestern Bank was burned to the ground. Much money, valuables, and papers are believed to have been destroyed.

The Morning Post building was seriously damaged, and a branch of the London Bank was reduced to ashes.

Much damage was done at Woolwich Arsenal.

## GREAT BRITAIN

Leading German newspapers publish an article, obviously inspired, explaining the reasons for the Zeppelin raids on England and justifying the killing of civilians as a "military necessity." The Lokalanseiger says:

"The purpose of the raids is to destroy military establishments and railway facilities for the transportation of troops and to imperil London, which is the chief center from which the British army derives its support. The destruction of civilians or private property cannot arouse protest by the British people, as their efforts to starve Germany erase the distinction between warfare on military forces and warfare upon the civil population."

A number of Berlin organs throw out vague hints that the raids upon London will soon be renewed on a larger scale.

A system by which approaching Zeppelins can be located is claimed to have been discovered by Lee de Forest, an American inventor, who has just arrived in England, says The Daily Express.

"My invention, which I am submitting to the British government, is a protective, not a destructive, device," said Mr. de Forest. "It will give warning of approaching Zeppelins and so allow them to be met by aircraft or gunnery fire before they can do any harm. The device will record air waves made by the Zeppelins on a microphone. These air waves are magnified by the audion amplifier, of which I am the inventor. The system is conducted in much the same way as the British Navy uses the microphone to record the approach of a submarine. It works better at night because the motors of Zeppelins allow greater registration of sound with a reduction of noises. I cannot, for obvious reasons, go into fuller details of my invention, except to say that it can with advantage replace an aerial guard from London to the coast."

## SWITZERLAND.

The Swiss Government has instructed its embassy at Berlin to lodge an energetic protest against a new violation of Swiss territory by German aviators. The protest is occasioned by the fact of an aviator in dropping eight bombs over Chaux-de-Fonds on Sunday, causing the injury of four persons and considerable damage to property. Switzerland demands compensation and the punishment of the aviator.



A searchlight for detecting the presence of Zeppelins.



## ON THE LIMITING SIZE OF AEROPLANES\*

By PROFESSOR HERBERT CHATLEY

A question very intimately related to that of the utility of aerial navigation is that of the maximum weight (and consequently size) of aeroplanes. There are many reasons for supposing that this limit is by no means a high one. So far as the writer is aware this question has been considered more thoroughly by Lanchester than any other authority, and he says ("Aerodnetics," pp. 151-2): "We may therefore anticipate that the flying machine will not on the most sanguine estimate exceed some few tons in weight, unless some considerable advance is made in the prime mover. . . . This condition may cease to apply if some artificial means be found for adding to the stability beyond that inherent to a rigid aerodone."

Similarly, Professor Newcomb, in an article to the *Nineteenth Century Magazine* in 1908, expressed an opinion that it would be impossible to construct very large machines. Lanchester bases his argument on the velocity necessary for stability, and Newcomb on dimensional theory.

Lanchester gives ("Aerodnetics," p. 328) the rule

$$V_{\min} = 16 \sqrt[3]{W} \quad (1)$$

as the minimum velocity allowable, this being based on his "phugoid" theory of stability.

A similar formula may be obtained directly from the data of natural flight. De Lucy (*Presse Scientifique des deux Mondes*, 1865), Harting (*Archives Néerlandaises*, I V., 1869), Mullenhoff (*Pflügers Archiv für Physiologie*, Bonn, 1884, Vol. XXX.), Precht (*Untersuchungen über den Flug der Vogel*, Vienna, Gerald, 1846), all agree in expressing the area of the aerofoils of flying animals in relation to the weight as

$$\text{Constant} \times \text{Weight}^{\frac{1}{2}} = \text{Area}^{\frac{1}{2}} \quad (2)$$

$$K \times W^{\frac{1}{2}} = A^{\frac{1}{2}}$$

$$\text{so that } A = K^2 W^{\frac{1}{2}}$$

Now we know that approximately the lift (= the weight) =  $c A V^2$  where  $c$  is a constant, so that

$$\begin{aligned} W &= c (K^2 W^{\frac{1}{2}}) V^2 \\ V^2 &= \frac{W^{\frac{1}{2}}}{c K^2} \\ V &= b \sqrt[3]{W} \end{aligned} \quad (3)$$

$b$  is a constant depending on the form and section of the wings, which for the purpose of discussion we need not yet determine, but the evidence is fairly clear as to the increase of the velocity with the weight. It should, however, be noted that since almost certainly the flight of animals depends on automatic stability, the adoption of some additional means of controlling stability (as by gyroscope) may modify the form of this equation.

Another limit is supplied by the exigencies of weight and of the power supply. It is well known that the thrust required to propel an aeroplane is equal to its weight multiplied by the tangent of the gliding angle (which is fairly constant for any one machine), and since this tangent cannot be appreciably reduced below a value of  $\frac{1}{6}$  we have the relation

$$P = \frac{W}{6}$$

or for power

$$P V = \frac{W V}{6}$$

or

$$H = \frac{W V}{3300} \quad (4)$$

The weight  $W$  consists of 3 parts:

$w_1$ , which is a function of the area, being the weight of the aerofoils and girders sustaining them.

$w_2$ , which is a function of  $H$ , being the weight of the motor.

\* Courtesy *Aeronautics* (London).

$w_3$ , the weight of the aviator and other dead load.

Lanchester writes  $w_1$  in the form  $K L^g$  where  $K$  is a constant,  $L$  is any linear dimension (say,  $f A$ ), and  $g$  is a constant. Within certain limits the weight  $w_1$  may be regarded as varying with the cube of the dimensions. It is, however, known that similar structures similarly loaded are stressed in proportion to the linear dimensions. (See Perry, "Applied Mechanics," p. 428.) This difficulty cannot be avoided except by varying the form of the structure. Suppose the increase of the general form is in the ratio 1 to  $n$ , and the frame scantlings are increased in the linear 1 to  $n^n$ . Then the weight is increased in the ratio 1 to  $n^{2n+1}$ , and since the sectional area of the scantlings is increased in the ratio 1 to  $n^{2n}$  we have the stress increased in the ratio  $n^{2n+1} \div n^{2n} = n$ . Hence mere variation of the scantlings will not do. The same difficulty occurs in bridge construction. A solid, straight girder bridge to span the Firth of Forth would probably not be able to support its own weight, and it was therefore necessary to use an open construction in which the weight did not increase as the cube of the linear dimensions. The same thing will probably have to be done in constructing a large aeroplane. The construction of the frame will have to be different from that of small machines. Since the principal effects are bending of the long girders these will probably have to be deepened out of proportion to the increase of length so that the stresses in the booms are not increased.

This was one of the principal difficulties raised by Professor Newcomb, and it is perhaps important to note that it is equally applicable to the construction of large bridges.

We may then suppose that the stresses are kept down to reasonable values by increasing the height of the machine (thus adding a negligible amount to the increased weight of the vertical members), so that the weight of the frame varies as  $L^q$  where  $q$  is less than 3.

If  $q$  can be kept down to 2 then the area and the weight  $w_1$  may progress together. This is perhaps not attainable, but it may be regarded as certain that the weight need not vary as the cube of the square root of the area as far as construction is concerned.

The second term  $w_2$  is purely a function of  $H$ . Presupposing similar types of motor and identical fittings it will be found in actual practice that the weight per unit power decreases with the power. It is, however, probable that the decrease is inappreciable after a certain value is reached, so that we may say  $w_2 = \text{constant} \times H$ .

The third item, the useful load (the previous weights being the "tare") may vary in any conceivable manner, and it will be the object of the aeroplane designer to increase this to the maximum extent consistent with efficiency. It can only be expressed as the difference between the total load which can be carried with a given area velocity and power and the above two items.

$$\begin{aligned} w_3 &= W - (w_1 + w_2) \\ &= W - (aA + eH) \end{aligned}$$

$$\text{or, since } H = \frac{W V}{3300} \text{ and } W = c A V^2 \beta$$

$$w_3 = W - \left( \frac{aW}{c \beta V} + \frac{eWV}{3300} \right)$$

$\beta$  varies inversely as  $V^2$  with a constant  $w_1$  so that we may say

$$w_3 = W - (fW + gWV) \quad (5)$$

Hence, with a constant velocity,  $w_3$  is a definite function of the load, but decreases with an increase of velocity, becoming zero when

$$W = fW + gWV$$

that is, when

$$V = \frac{(1-f)}{g}$$

Soreau has attempted to arrive at an exact expression somewhat on these lines, but the variation transcends useful mathematical expression. The amount of fuel required and its decrease with consumption is, of course, a most important factor.



## THE "FACTOR OF SAFETY"

The term "Factor of Safety" is often used in aeronautical writings in a manner not quite consistent with that in which it is employed by engineers. The normal stress coming on any part of the machine is taken as that which it has to bear in steady horizontal flight, produced, that is, by a loading equal to the weight of the machine, and if the breaking stress is  $N$  times this, then  $N$  is called the factor of safety. But a machine in its ordinary use may frequently have to carry a load much in excess of that which it bears in steady horizontal flight. It would be more consistent with engineering practice to estimate as best we can what is the maximum stress the machine in its daily use may have to bear and then take as the factor of safety the ratio of the breaking stress to this maximum stress. The factor of safety would thus take account of imperfections of workmanship or of material, not of the varying load. Thus, if we suppose that the maximum stress we ought to allow for is that due to a loading equal to  $N_1$  times the weight of the machine—the normal loading in horizontal flight—and that the breaking stress is  $n$  times this, so that  $n$  is the true factor of safety, then the ratio of the breaking stress to that occurring during steady horizontal flight is  $nN_1$ , and—calling this  $N$ , so that  $N=nN_1$ —then  $N$  and not  $n$  is the factor of safety as ordinarily (but I think mistakenly) used in aeronautics. The procedure gives a fictitious value to the factor of safety.

The value of  $N$  has been determined by calculation, and in some cases by direct experiment for a number of machines, and appears to range from three to seven. Let us consider briefly whether these figures are sufficient and ask ourselves in the first place what are the maximum stresses a machine may be expected to experience in flight and what value we ought to give to  $N_1$ , the ratio of these maximum stresses to those arising from the weight of the machine. We may perhaps call  $N_1$  the load factor or factor of loading. Let us consider first a machine flying at its maximum speed, and suppose the speed range is equal to the maximum speed, so that the minimum speed is half the maximum. When flying at minimum speed the angle of attack is of course a large one, and the lift coefficient in this attitude must be four times as great as when flying at its maximum speed. This might mean that the angle of attack was increased from some  $3^\circ$  to  $12^\circ$  or

$14^\circ$ , say through some  $10^\circ$ . If such a change could take place suddenly before the machine had time to change its attitude and adapt itself to its new conditions, since the lift coefficient is increased four times and the velocity is unchanged, then for the moment the stresses thrown on the machine are four times as great as those it experiences in steady horizontal flight at maximum speed. Now experiments on vertical air currents are not very numerous, but direct experiment shows that upward velocities of 10 to 15 feet per second have been observed, and these, if suddenly experienced, might be sufficient to alter the angle of attack by some  $10^\circ$ . Moreover, it appears that owing possibly to some obstacles or to the conformation of the ground the direction of the wind may alter—without change of speed—sufficiently in a distance comparable with a few lengths of an aeroplane to produce this change in the angle of attack. More careful investigation based on solutions of the equations of motion would give from three to four as the factor by which the loading may be increased, due to a sudden change in the angle at which the wind strikes the machine.

Another cause of serious sudden increase in loading is rapid flattening out after a dive.

Let us again take the case of a machine in which by an alteration of the angle of attack the lift coefficient may be increased in the ratio of 4 to 1. Calculation, and in one or two cases observation, have shown that it is possible for such a machine in a long steep dive to reach a speed approaching twice its maximum flying speed; the stresses are everywhere increased four times in consequence, since they vary as the square of the speed; suppose now the elevators are put over quite suddenly as far as possible, so as to check the speed and bring the machine into the attitude relative to the air appropriate to minimum speed; the lift and hence the stresses are again increased fourfold. Thus, if this could be done instantaneously without gradually checking the speed, the stresses would be sixteen times those due to normal loading. Such sudden action is no doubt out of the question, but calculations, so far as it has been possible to carry them, show that stresses from eight to ten times those due to normal loading may be caused.

## MEASUREMENT OF SKIN FRICTION

A propeller testing apparatus for the purpose of comparing the skin friction on different surfaces has been announced in England by Messrs. Mauraint and Moismont. The particular virtue claimed for their method is that it eliminates the air resistance of the ordinary type. In studying air friction Prof. Zahn used a flat plate, but by his method he obtained in addition to the friction of the air on the plate, forces resulting from the impact of the air, and the turbulence at both extremities.

The new device measures the couple transmitted to the propeller shaft according to Toussaint's method, but "its delicacy has been increased until it is possible to measure the couple due to the friction of the air alone."

A flat and highly polished steel disc 160 centimeters in diameter and 4.5 millimeters thick at the centre and tapering to 2 millimeters at the periphery, is fixed at the extremity of the shaft. The couple as transmitted to the shaft at various speeds is then measured.

"The disc revolves on a perfectly level axis and is exactly balanced; the reading, consequently, gives simply the friction of the air and of the bearing. But that of the latter forms only a very small proportion of the reading obtained, and has been measured by substituting for the steel disc a lead cylinder of a small diameter (22 centimeters), but of the same mass; it is independent of the speed of rotation and equal to 0.075 kilogram-meter. It is, of course, deducted from the total couple measured.

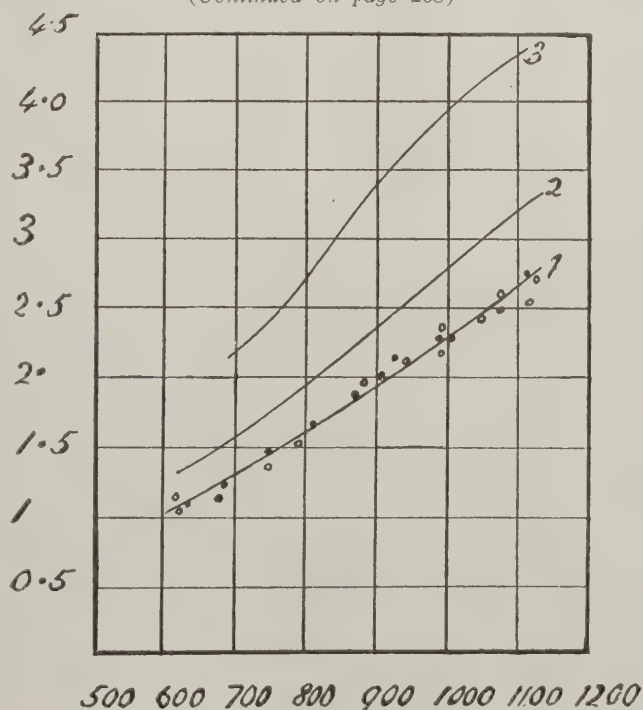
"The results of the first experiments are shown in the curves plotted herewith, giving in kilogram-meters the value of the couple as a function of  $N$ , the number of r.p.m.

"Curve 1 represents at once the results obtained with the polished steel disc (black dots) and those obtained with the disc covered with ordinary aeroplane fabric "doped" with several coats of varnish with a cellulose acetate base, and consequently exactly representing the surface of an aeroplane wing (circles). Curve 2 denotes the readings given by the disc when covered with a similar fabric to that just mentioned with only one thin coat of varnish, while curve

3 shows the greatly increased resistance when the disc is covered with the ordinary yellow balloon fabric.

"It will be observed that, whereas the friction of the air on a well-varnished aeroplane fabric is about the same as that on polished steel, the friction on balloon fabric is greater by

(Continued on page 208)







# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1363 Townsend Avenue, Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 130, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**HARLEM MODEL AERO CLUB**  
73 West 106th Street, New York City  
**MILWAUKEE MODEL AERO CLUB**  
402 Bradford Avenue, Milwaukee, Wis.  
**CONCORD MODEL CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**AERO CLUB OF ST. LOUIS**  
Columbia Bldg., 8th and Locust Streets, St. Louis, Mo.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### Aero Science Club of America

The scientific workings of the aeroplane propeller were the subject of discussion at the last meeting. For fully an hour Messrs. Durant, Hodgins, and Parker, the latter of whom is now constructing a full size machine, technically discussed the operations of the propeller. And as these members are thoroughly conversant on the science of aeronautics the discussion was most interesting and informative. The object in view is the adoption of a formula to be used in judging models in a scientific contest which will be arranged for at a later date. Many members contemplate using rubber motive power, while others will use compressed air, gasoline and other means of propulsion. Therefore, the usage of such methods of propulsion requires a formula which will do justice to all and it is believed, in view of what already has been accomplished, a suitable formula will be submitted at the next or following meeting.

During the past many inquires have been received asking for information on aeroplane construction, motors, propellers, etc. In view of this fact the following committees have been formed to look after these inquiries: Motor Committee: Messrs. Hodgins, Lott, Schober and Funk; Aeroplane Committee: Messrs. Meyer, Thiele, Barker and Parker. Letters were received from the following clubs stating their desire to affiliate with the Aero Science Club:

The Springfield Model Aero Club, Springfield, Mass.

The Plattsburg Model Aero Club, Plattsburg, N. Y.

In view of the increase in correspondence it became necessary at the last meeting to elect an Ass't Secretary. Mr. R. C. King, Jr., was elected to serve in that capacity.

For further particulars address the Secretary, 29 West 39th St., New York City.

### Illinois Model Aero Club

By WARD PEASE

Drawings and specifications of Hittle's hydro are being prepared and will soon be sent to AERIAL AGE for publication.

Our aviator-president, Laird, has made arrangements with the Aero Club of America and he will fly for his pilot's license Sunday, November 14th, at the Ashburn flying field. At the same time the Illinois Model Aero Club will hold a meet for R. O. G. models. From there Laird will ship his machine to Ohio, where he is to give an exhibition. He in-

tends to take his machine from there to Mineola flying field, while he takes up work in an aeroplane factory where he has secured a position.

Just before he goes there will be a special speakers' meeting at the Auditorium Hotel, where he will speak on his successes this year, and Hittle will speak of the clubs showing in the National Model Aeroplane Competition, etc.

### Orange, New Jersey, Model News

The young men of the Oranges (New Jersey) are becoming more and more interested in the sport and science of model flying and construction, and indications are that by next spring a large number of young men will be constructing flying models. To stimulate interest and teach those interested the Y. M. C. A. has outlined plans whereby classes will be held in the Y. M. C. A. building at Orange, N. J. Models will be on exhibit at the Y. M. C. A. and other places during the winter.

On Tuesday, Mr. G. A. Cavanagh, Secretary of the Aero Science Club and Model Editor of *Aerial Age*, talked for one-half hour to the young men of the East Orange High School, on invitation from Mr. Files, principal. The subject of the talk was the advantages of constructing and flying models. Mr. Cavanagh was much applauded at the conclusion of his talk, which indicated that his audience was interested, and it is believed that good results will follow. Mr. Files, the principal of the East Orange High School, is not only interested in a general way, but he is an active member of the Model Aeroplane Committee of the Y. M. C. A. After concluding his talk at the High School, Mr. Cavanagh, on invitation from Mr. W. H. Smith, principal of the Elmwood Avenue School, spoke to the boys of that school on the same subject, and as before much interest was shown. At the suggestion of Mr. Smith, principal, a club will be formed at this school and instructors from the Aero Science Club will be asked to teach the young men how to construct and fly models. Mr. Hunter B. Grant, Secretary of the Committee, who accompanied Mr. Cavanagh, was very much pleased with the interest that was shown. Mr. R. H. Jacobus, Chairman, who is active in stimulating interest, will endeavor to arrange with the principals of other schools in the Oranges to give the boys of their respective schools an opportunity of becoming acquainted with this new sport.



The accompanying photograph shows a group of members of the Illinois Model Aero Club taken during the hydroaeroplane contest, the last contest of the National Model Aeroplane Competition held under the auspices of the Aero Club of America. At the right end of the picture Lindsay Hittle is shown holding his model which broke the world's record for model hydroaeroplanes. Ellis Cook is standing toward the rear in the center. The model flown by Ward Pease is the second one from the left end. In view of accomplishments this club now holds an indisputable position of importance in the field of model aeroplane activity.





Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Up-to-date

The aviator who has just fallen into a river—Lemme go! I'm all right; I can swim.

The girl—I don't care. I'm going to save you. I want a medal.—*Chicago Herald.*

#### The Fruit Thereof

He boasts about his family tree  
Does Algy Mutt;  
But in his case, it seems to me,  
It bore a "nut."

#### A Change

"Rain, rain, go away;  
Come again another day,"

is all wrong—all wrong, in the opinion of the naturally festive Londoner. The old couplet has been revised into something like this:

"Rain, rain, every day;  
Keep the Zeppelins away."

#### Motor Orthography

Caller—I suppose you can spell all the short words, Bobbie.  
Bobbie—I can spell a lot of big ones, too. I can even spell the words of four cylinders.

#### Some Trip

The goldfish thinks nothing of a trip around the globe.

A funny story is told about Jack Johnson, in London, who was appearing in a revue at one of the suburban music halls. Asked by the management to make some quieting announcement to the audience, the once world's champion appeared before the curtain and said:

"There ain't no use trying to lie to you all. Right now there is one of them Zeppelins over this here theayter, but it won't do no good to get scared, and you might better take a chance here than go outside and ask for trouble."

#### In London

Landlady hammering with poker on lodger's bedroom door, (2 a. m.): "'Ere's the Zeppelins, Sir!"

Lodger (from deep down in the pillows): "Right-O! Put 'em down outside."—*Punch.*

#### The Aviator

Oh, I clamber up high to the vault of the sky,  
Far above all the muck of the trenches,  
Far above the quick ire of the maxim-gun fire,  
Far above all the reek and the stench.  
There's a puff from below in the lines of the foe,  
Where a gunner is seeking to harm me,  
But I drop and I rise from his bombs in the skies  
And I still am the Eye of the Army!

For it's my job to learn every sally and turn  
Of the enemy right when they make it.  
I'm a sentry whose care is a post high in air  
And it isn't for me to forsake it.  
So I duck and I dip and I dodge and I skip,  
From the aeroplane shells that would mar me,  
While the gunner with zest does his Sunday school best  
To put out the Eye of the Army.

Now there isn't must chance for the ancient romance  
In these days of mechanical slaughter,  
When we shed human blood in a horrible flood  
On the face of the land and the water;  
But I am not bound by the soldiers' dull round,  
For in war's mighty drama they star me,  
And it's still a great game full of glory and fame—  
To the venturesome Eye of the Army!  
BERTON BRALEY in N. Y. Times.

Aviator Demarsk of that belle France has equalled the world's altitude record. The climbing record is held by the Italians.

#### He "Thinks" So

Her father—Do you think you can support my daughter in  
t. s. t. w. s. h. b. a.?

Aviator (frankly)—No, sir; but I can support her on 'eir.

#### Military Mems

To the victors belong the spoiled towns and villages.  
Are the Russian army costs charged to running expenses?  
Speaking of soldiers, a body of burglars should make a crack corps.

And a corps of stokers should be able to advance under a hot fire.

Why do soldiers need blankets when they can cover themselves with glory on the field?



(Courtesy Bud Fisher and N. Y. World.)



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### Sturtevant News

Capt. Mark L. Bristol, in charge of the Bureau of Naval Aeronautics, recently visited the Sturtevant Works at Hyde Park, Boston, Mass., accompanied by Lieut. Chevalier, Inspector of aeronautical material. Capt. Bristol spent considerable time in inspecting the details and construction of the various parts of the motors.

The primary object of his visit, however, was to witness a test on one of a lot of several motors being built for the U. S. Government by the B. F. Sturtevant Co. The test to determine the brake horsepower of the motor was carried out under the supervision of Mr. F. B. Conway, U. S. Inspector of aeronautical motors at the works. The motor was connected direct to a dynamometer and the results showed that not only did the engine develop its rated horsepower of 140 at 2,000 r.p.m., but exceeded it. Capt. Bristol was very much pleased with the results.

A Model 5, 140 h.p. eight-cylinder aeronautical motor was recently shipped to Mr. Harry Payne Whitney, the aviator sportsman of New York. The engine was installed in Mr. Whitney's Burgess-Dunne hydroaeroplane, replacing an unsatisfactory motor of another make. Mr. Whitney reports that the Sturtevant motor is entirely satisfactory and he is extremely pleased with it.

The aeronautical motor testing plant was damaged considerably by fire on the evening of November 1st. Contrary to reports there was no experimental aeroplane lost and only one motor was slightly damaged. The fire was hardly out before plans for a temporary test house were under way, and within two days the testing of the motors was continued as if nothing had happened. The temporary test house is complete in every detail even to electric lights. A new test house will be built to replace the one burned, and it is understood that in addition to being considerably larger than the old one it will be built of fireproof construction throughout. The work on the same is now well under way.

### Niles and Petterosi Loop at Night

In a recent issue of *Aerial Age* we made the statement that Art Smith was the only aviator in America who was looping at night. A valued correspondent calls our attention to the fact that Charles F. Niles and Silvo Petterosi are now looping at night on the Pacific Coast.

### Thomas News

During the past week, the first of the Navy Seaplanes has been given its first trials. It demonstrated its ability to plane on the water on its twin pontoons, and also showed that it could successfully withstand hard landings.

The youthful Thomas instructor, William Brock, has gained great praise by his handling of the 1916 Model Flying Boat, having circled over the city on numerous occasions, flying often at a height of well over 3,000 feet.

The factory has recently enjoyed a visit of inspection from Alessandro Pomilio, the Italian aeronautical expert. He was chiefly interested in the demonstration of the Thomas Aero-motor, and in the new 135 H. P. tractor biplane, expressing himself as being greatly pleased with both their design and construction.

### Measurement of Skin Friction

(Continued from page 205)

70 per cent. Moreover, the increase in the resistance relatively to the increase in speed is no longer so uniform. Since the retarding effect due to skin-friction on the envelope of a dirigible is an important portion of the total resistance, it is obviously very important to use fabric offering but little surface friction.

"The process just described serves excellently as a means for obtaining comparative values, but scarcely lends itself to the measurement of the absolute value of the coefficient of skin-friction, for the air in the immediate neighborhood of the disc is whirled round and hence subjected to a certain amount of centrifugal force, whence arises a somewhat complex relative movement."

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VOL. II

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No. 10

### Curtiss Sets Standard for British Admiralty

**A**FTER a year of experiments in seaplanes the British Admiralty has adopted as its standard the construction used on the flying boat, America, built last year for Rodman Wanamaker, by Glenn H. Curtiss, and Commander John Cyril Porte, R. N., Hammondsport, N. Y., according to a special despatch from Gordon Bruce to the New York *Tribune*.

"It was through the efforts of Commander Porte, now in charge of one of the most important naval air stations in England, that the America type finally was recognized as the best. When first these machines were brought to England, in the autumn of 1914, they were scoffed at by most of the powers in the British navy.

"In an effort to 'show up' the American craft every possible type was tried out, but failed to come up to the efficiency of the Wanamaker plane. And now no other construction is considered.

"The chief advantage of the boat finally determined upon is that it can hold its own in a rough sea. The big, single boat, with sea-sled bottom, ploughs its way through the most troubled waters, riding safely in weather which would swamp the ordinary flying boat and play havoc with the double pontoon type of hydroaeroplane.

"The writer has it on good authority that the most powerful seaplane ever built is almost completed, and soon will be flying over certain points on the British coast. It is of the America type, although very much larger than the machine which had its first trials in Lake Keuka fifteen months ago.

"The new craft, it is said, will have a lifting capacity of more than seven thousand pounds, while its motors will turn out something like 900 horsepower—all of which will mark a wonderful step in the application of the aeroplane to warfare.

"This aerial monster will carry rapid-firing guns—possibly some of unusually heavy calibre. Also, it will be capable of flying at high speed carrying tons of bombs. While it is impossible to learn all of the details, and it is not permissible to print some of those at hand, it is safe to say that no battleplane or seaplane nearly so formidable has yet been constructed.

"Officials of the naval and military air services are taking a keen interest in the proposed activity of the United States in acquiring a large aerial fleet. Of course, the suggested appropriation of \$8,000,000 does not appear ample to a nation which has learned the value of aircraft in war, but interesting comments are being made.

"That eight millions will not go very far if the United States government tries to begin where we did," one official said to-day. "We have been through the mill here, and know what it means to be forced to scrap hundreds of thousands of pounds worth of material because we had not been sure what was required.

"If America starts in with a fleet of small aircraft the money spent on it will be absolutely wasted. A small flying boat, or military aeroplane, with a speed of 60 miles an hour, is not worth the space it occupies when actual service in war time is considered.

"The scout machines must have speed as close to 100 miles

an hour as possible—or even more. The seaplanes and battleplanes should be built on mammoth dimensions—the bigger, the better—and equipped with all the power obtainable. Money should be no object in building an air fleet. Try to save expense, or to substitute untried material for what is known to be the best, and you may as well quit before you start."

"The launching of an aerial program by the United States without a change of administrative policy (in aviation affairs) was freely criticized by a prominent authority who has been in close touch with the situation here since the war began.

"It is difficult to imagine what will happen if the organization of a military flying corps for the United States is left in the hands of the signal corps," he declared. "Not that the personnel of the signal corps is not the best, but the two branches should not come under one control.

"As I understand it, the United States Signal Corps has never handled an appropriation of more than about \$300,000. To expect that department to take up the building up of an air fleet—work in which it has had little experience—and involving the expenditure of millions is absurd, unless the personnel of the signal corps is more than trebled, perhaps quadrupled. In that case it seems as if it would be much better to form a separate branch, as the nations of Europe have been forced to do."

It will be remembered that *The Tribune* pointed out, more than six months ago, the advantages to be gained by the separation of the aerial service from the signal corps, and among the aeronautical authorities of the European nations not one can be found who does not advocate such a step if military and naval air service is to mean anything to the United States.

### Aerial Coast Patrol System Must Be Established from Private Purses

**T**HE initiative taken by Rear Admiral Robert E. Peary, and by the state of Maine in arranging for the establishment of the first of a series of aerial coast patrol stations that shall include the whole coast line of the United States has met with the unqualified approval of all who are interested in aeronautics and in adequate preparedness. The utility and the need are so self-evident that it is expected that the states will make provision for aeroplanes in their various zones, and though this is a work that will have to be done by contributions from the purses of the public, at least until the government sees the need of such stations, the amount required to protect the whole coast line is small compared with the results that will accrue.

John Hays Hammond, Jr., who last August suggested the establishment of this system, says:

"This is the beginning, and I feel sure that all the other coast states will follow suit. It will only take forty-four aeroplanes to properly patrol all our coasts, and these, with the radio installations, receiving stations, hangars and other equipment, will only cost about \$400,000. There should also be forty-four aeroplanes in reserve. There would be three shifts of aviators, or 132 men, and these, with forty telegraphers, would be able to man the whole system. As the coasts of this country are divided, Maine would have three

**AMERICA MUST BE RESTORED TO THE POSITION OF SECOND NAVAL POWER.  
EVERY CONSIDERATION OF ITS SECURITY DEMANDS THIS SHALL BE DONE AT ONCE.  
THE PEOPLE WILL BE SATISFIED WITH NOTHING LESS.**



stations or zones; Massachusetts, Rhode Island, Long Island and New Jersey, one zone; Virginia and North Carolina, two zones; South Carolina, three zones; Georgia, one zone; Florida, nine zones; Alabama, one zone; Mississippi, one zone; Louisiana, three zones; Texas, three zones; California, eight zones, and Oregon and Washington, two zones each.

"With this system it would be possible for Washington, in case of war, to know every hour and a half the exact conditions along our entire coast line. Admiral Peary deserves credit for his indorsement of the aerial coast patrol, and it is to be expected that many other public-spirited citizens will follow his lead."

Henry A. Wise Wood, president of the Society of Aeronautic Engineers, and a member of the Naval Advisory Board, has been very active in promoting the movement for the aerial coast patrol. The Lusitania disaster would not have occurred, he points out, if England had had such a system as is now to be established in this country.

Alan R. Hawley, president of the Aero Club of America, said that the importance of the establishment of the first of the Casco Bay stations as the first step in the aero-radio system cannot be over-estimated. "In view of the fact that the proposed army and navy programs for next year, published recently," says Mr. Hawley, "provide for only a very small increase in the aeronautical equipment of the army and navy, and do not provide at all for equipping the land and naval militia with aeroplanes, it will become necessary to develop an aeronautical reserve, to be supported by public subscriptions. Therefore, this aero-radio system of defense stands forth as a most valuable project. It is at once inexpensive and efficient."

"The governors of the Aero Club are greatly pleased at the establishment of the Casco Bay station, and Admiral Peary deserves great thanks for giving the use of Upper Flag Island, there, as the base for the headquarters of Zone No. 1. To show the position taken by the Aero Club, the governors will add 10 per cent. to all sums raised before February 1, 1916, for the purpose of establishing the aerial patrol."

Henry Woodhouse, a governor of the Aero Club of America; A. M. Lambert, of St. Louis, who represents Missouri in the Navy League; Elmer A. Sperry, inventor of the gyroscope, and Alberto Santos-Dumont, the pioneer in aeronautics, all heartily commend the work of Rear Admiral Peary in advancing this necessary part of adequate national defense. Now that Admiral Peary has shown the way there are hundreds of others who will not hesitate to follow, for it is agreed that until the government can be made to see the necessity of providing a system of coast defenses of this character patriotic and public-spirited citizens must come to the front.

#### Women of 1915 Offer Funds for Aerial Coast Defense.

THE women of 1915 have offered to raise funds to provide an aeroplane for the coast defense of New York through their president, Mrs. Edward D. Mosley, in a letter received by Alan R. Hawley, president of the Aero Club of America. She writes that "The Women of 1915, the organization of which I have the honor to be president, fully realizing the importance of improving our national defenses in the most immediate future, and wishing to do its share of the work to be done in order that this country may be placed in a position which will enable it to protect itself 'against foreign aggression, and to provide for the preservation of American institutions at home and American rights abroad,' has decided to raise \$10,000 for establishing a unit of the aero-radio system of national defense, recently proposed by Mr. John Hays Hammond, Jr."

"In order to launch the movement to secure the funds for this purpose, the Women of 1915 will hold a subscription ball on Wednesday evening, December 8th, at the Biltmore hotel, to which the members of the Aero Club of America, the twenty-six affiliated clubs, and the organizations working for national defense are cordially invited."

"We invite the advice and co-operation of the Aero Club of America in carrying out this project."

To launch the movement a subscription ball will be held on Wednesday evening, December 8, at the Hotel Biltmore, to which the members of the Aero Club of America, the twenty-six affiliated clubs, and the organizations working for national defense are invited.

Mrs. Charles S. Whitman, wife of the governor, appeals for adequate aerial protection.

"When I made my first flight over the Hudson River," she says, "and saw from my secure position 1,500 feet up in the air the towns on the eastern bank of the river, the ships and the bridges, and when I realized that nothing could prevent us from dropping things on those towns and bridges and ships, and that the movements of the people and automobiles on the roads below could not have been hidden from us, I realized the necessity of having aeroplanes for our army, navy and militia—many of them."

Other women helping in the movement are Miss Mary E. Burt, the well-known authoress and educator, who lives at Coytesville, N. J., has written to the officials of the Aero Club of America, offering to turn over a plot of ground at Englewood Cliffs, which she owns, for use as an aeroplane landing station. This offer has been referred to Rear Admiral Peary, chairman of the Aeronautical Maps and Landing Places Committee, who is in charge of the plans to establish landing stations throughout the country.

Miss Anita Comfort Brooks, president of the Gotham and Gridiron Clubs, has written to the Aero Club, proposing to have the subject of development of aviation corps taken up by the Federation of Women's Clubs. Women have been taking a keen interest in the movement to develop aviation corps for the militia of the states, which, instituted by the Aero Club of America only a few months ago, already has resulted in twenty states taking steps to organize aero companies.

The formation of an aviation squad in the National Guard of New York was made possible by a prominent lady, who gave \$10,000 for the acquisition and operation of an aeroplane, and for the training of two officers of the militia and two mechanics to operate it.

The militia of Rhode Island was supplied with an aeroplane by Miss Lyra Brown Nickerson of Providence, who sent a check for \$7,500 to the National Aeroplane Fund.

#### Need of Aeroplanes

(Editorial in the Tacoma Ledger)

WHILE details of the uses to which the proposed \$400,000,000 appropriation for the army and navy will be put have not been given out, it is understood that the administration will ask for liberal sums for aeroplanes. For national defense we need aeroplanes both in the army and in the navy. Our military establishment has done little in aviation. There are only a dozen aeroplanes in the army, navy and militia at the present time. The number of trained aviators is very small.

The war in Europe has taught us that aeroplanes are the eyes of the armies. They ascend and find the location of enemy troops and artillery. They are a safeguard against surprise attacks. But they are something more. Rapidly they are developing into offensive instruments. They hurl explosives down on railroad lines and cut communications. They blow up munitions plants, and they assist in finding the range for heavy artillery. Advancement in aviation has been very rapid since the war began. Larger, swifter and more powerful flying machines have been developed.

In using the aeroplanes appropriations, which congress will be asked to make, the United States will have the benefit of the most recent developments in the European war, and our inventors and mechanics may be depended upon to add many improvements.

There is not a single aeroplane, according to AERIAL AGE, at the Panama canal, in the Philippines or Hawaii, each of which places is a vital center. The army has one aviation station and the navy one, whereas it is submitted there should be a station at every army and navy center.

It is a fact not generally known that private individuals, convinced of the vital importance of aviation in national defense, and disappointed over the lack of support hitherto by the government, have contributed more than \$20,000 to a national aeroplane fund. The executive committee of that fund recently decided to set aside \$2,000 to be used in training aviators in California, Arizona and Texas, states bordering on Mexico. If we had several aviators on the Mexican border it would be a big help to our troops guarding the line.

The problem is too big and vital, however, to depend upon private contributions. The federal government should provide adequate funds for aeroplanes.



# THE NEWS OF THE WEEK

## Wright Co. Increases Capital to \$5,000,000

The Wright Aeroplane Company has filed papers increasing its capital stock from \$1,000,000 to \$5,000,000, par value \$100. Henry Lockhart, Jr., president of the Simplex Motor Company, has been elected president; C. S. Jennison, attorney for William B. Thompson, who is now in control of the Wright company, vice president, and Harvey D. Gibson, a vice president of the Liberty National Bank, treasurer. Harry Payne Whitney, Philip T. Dodge and Mr. Rockhart have been added to the board. The other directors are T. Frank Manville, Mr. Jennison, Mr. Gibson and Henry R. Sutphen, vice president of the Electric Boat Company.

Mr. Lockhart sailed for Europe recently and it is understood that while abroad he will consult with important interests with a view to signing up new contracts for the sale of a large number of Wright aeroplanes to the Allies. As has been previously announced, Orville Wright will continue with the company in an advisory capacity.

The Wright Aeroplane Company has mapped out comprehensive plans for development work and scientific research. Production will be greatly enlarged, and machines will be placed on the market at once. The election of Mr. Lockhart is significant, in view of his position in the Simplex Motor Company.

Mr. Manville had previously been elected president of the reorganized Wright corporation, but resigned owing to the stress of other duties. Besides retaining his position as a director he also remains as a member of the executive committee.

## Year Round Flying at Puget Sound

The handling of the Northwest Aero Club's Martin aeroyacht by Floyd Smith in the strong winds that prevailed during the early part of the month has proved beyond a doubt that flying can be accomplished in the Puget Sound country throughout the year, as records fail to show many days on which the wind attains a higher velocity than those of the days on which Smith made daily flights, landing with ease on the rough water.

Mr. Boeing, the president of the Northwest Aero Club, has been making solo flights, and his exceptionally fine landings stamp him a pilot of excellent skill.

Aviator Herbert Munter has had the pleasure of being the first club member other than the president to make a flight in the Martin machine with Smith as pilot.

Ed. Hubbard, of the Maroney School, is to make solo flights as soon as the 100 h.p. Curtiss motor in the hydro is replaced with a sixty.

## Aeroplanes Part of a Cruiser's Equipment

The success of the government's new aeroplane launching device tested on the North Carolina at Pensacola, has, in the opinion of naval officers in Washington, made it practically certain that the new scout cruisers of the navy will have aeroplanes as a part of their regular equipment. The officers referred to foresee that the cruisers will be designed to carry and accommodate aeroplanes, for with the success of the new catapult it is evident that the efficiency of a scout will be greatly increased. With an aeroplane as an adjunct a scout will be able to report on a larger area than ever before, and will be equipped to perform a range of service far greater than is now possible.

The Navy Department hopes that by next spring there will be assigned to the Atlantic battle fleet an aviation ship equipped with a launching device and that when spring practice opens the exercises will include aerial scouting at sea.

Additional tests of the launching apparatus have been made on the North Carolina. Two of the launchings were made while the ship was making five knots an hour. The next experiment will be to make a launching while the ship is at sea.

Captain Mark L. Bristol, Chief of the Office of Naval Aeronautics, hopes for great progress in naval aeronautics during the next year.

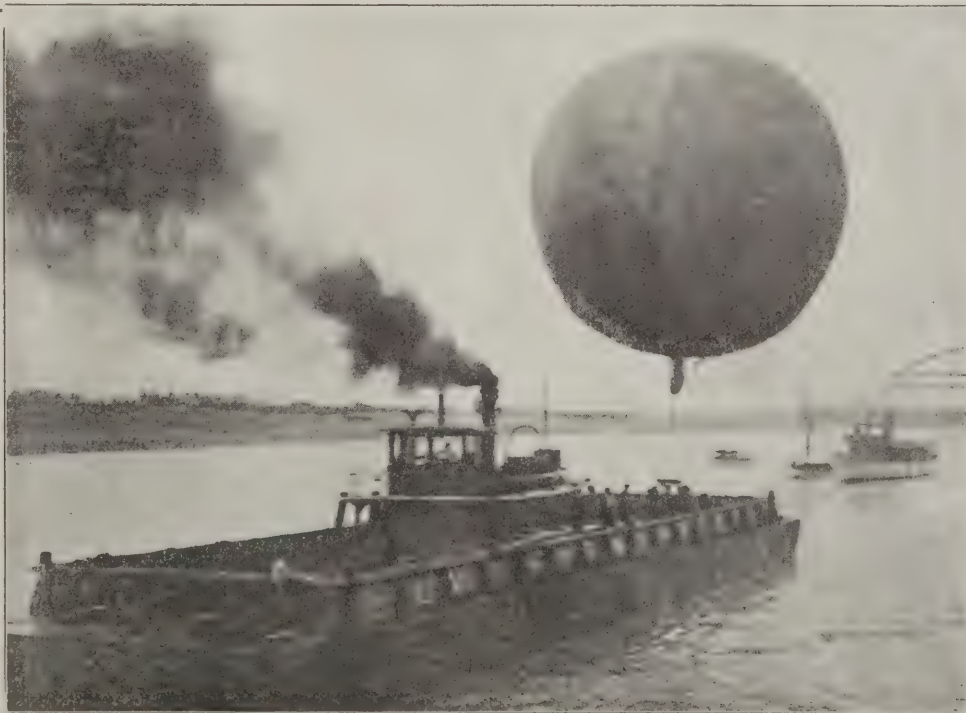
## Aerial Coast Patrol Approved by President

The movement inaugurated for the establishment of a series of aerial stations, which shall extend along the whole coast line of the United States, has been approved by President Wilson. He regards the plan as a commendable step for the upbuilding of our national defenses.

The matter was officially brought to the attention of the President when the Chamber of Commerce of Portland, Me., notified him that a committee had been appointed to represent the cities of Portland, Bangor, Waterville, Augusta, Brunswick, Bath and Lewiston to raise \$10,000 to buy a hydroplane and other equipment needed for a patrol station.

In this movement the Aero Club of America is co-operating with the Portland Chamber of Commerce and the business men of Maine have taken the matter up with such determination that there is every expectation their plans will be crowned with success at an early date. What Maine has undertaken to do the business men of other seacoast cities and states will in all probability take up in the near future. The establishment of an aero station is a commercial advantage to a city, besides being a needful patriotic work.

The balloon "New St. Louis" being towed on the Mississippi to the starting place from which it made a trip to Bingham, Illinois. Capt. Honeywell piloted the balloon and he had as passengers Miss Kiel, daughter of the Mayor of St. Louis, and Mrs. W. A. Logan. The balloon got away beautifully and remained aloft for two hours.







A. Livingston Hall, who was recently a student at the Curtiss School at Hammondsport, and who has just qualified for his pilot's license.

#### Declined Place in Villa's Aviation Corps

Curtiss La Q. Day, of Chicago, the youngest licensed aviator, some time ago declined an offer to join General Villa's aviation corps in the Mexican campaign. The offer of compensation, \$150 a week, was later increased to \$300 a week. It is understood that the opportunity was rejected, not because of the risk involved, but because he is under a two years' contract with the Benoist Aeroplane Company of Chicago.

#### Aeroplane Escort for Liberty Bell

On its return from San Francisco to Philadelphia the Liberty Bell will be convoyed through a part of Texas by a fleet of aeroplanes. Aviators at Dallas, Texas, have announced their intention to fly over the bell, and Captain H. B. Foulois, commander of the aero station at Fort Sill, Okla., who is to make a cross country trip to San Antonio during the latter part of the month, has been asked to make his arrival in Dallas simultaneous with the arrival of the bell in that city.

#### Newspapers Engage an Aviator

The Rocky Mountain News and the Denver Times provided a treat for the people of Denver and vicinity on November 14 by engaging Aviator C. S. Peterson to make flights from the municipal golf links.

#### Niles Going to the Orient

Charles A. Niles on Nov. 6 completed his engagement at the Panama-Pacific Exposition in San Francisco and, with his manager, Mr. Heller, is now on his way to the Orient, where he will give exhibitions. He will first go to Japan, where his series will be opened with a flight before the Emperor, after which he will exhibit in other parts of the kingdom. This, it is said, will be the first time that the Orientals will have the opportunity of seeing day and night looping. From Japan, Mr. Niles will go to China, where he will exhibit under the auspices of the Imperial Club. He hopes to return to this country in February or March.

Mr. Niles' engagement at the fair was very successful, and on the last day of his appearance he won a silver cup in a race.

#### A. Livingston Allan and William F. Sullivan Qualify as Marine Pilots

A. Livingston Allan, of Jersey City, and William F. Sullivan, of Providence, who have been taking a course at the Curtiss Flying School, qualified for their pilots' license last week.

Mr. Allan will remain at Hammondsport for some time and Mr. Sullivan will go with the Hon. F. C. G. Edento Bermuda to organize a flying school during the winter months.

#### McCulloch Goes to Italy

David H. McCulloch sailed on the Taromina for Italy Saturday of last week for the purpose of instructing the Italian naval officers in the flying of the Curtiss boats which have been sold to the Italian Government.

#### Value of Zeppelin Increasing

That the value of the Zeppelin has so increased as to make it a potential factor, and the United States must at once enter upon the construction of this type of dirigible if it is to have adequate aerial defenses is the substance of an opinion made public by Henry A. Wise Wood, President of the Society of Aeronautic Engineers, Vice President Aero Club of America, and a member of Secretary Daniels' Naval Consulting Board. Mr. Wise Wood based his opinion upon the information contained in a report he had received from England, and which is regarded as being of the utmost importance to those interested in aeronautics, especially as related to national defenses.

#### Aero Club of Pennsylvania Growing

Interest in the affairs of the Aero Club of Pennsylvania is being increased by sending club bulletins and copies of the minutes of each meeting to all members. Through the efforts of President Steinmetz and Treasurer Maresch the membership is steadily increasing. It is expected that at the next meeting Mr. Scott, of San Francisco, maker of the Hall-Scott motor, and Glenn Martin, of Los Angeles, builder of the Martin war planes, will be elected to membership.

#### Permanent Hangar for Pennsylvania Club

Lieut. F. R. Harris, U. S. A., has prepared plans for a permanent hangar for the Aero Club of Pennsylvania and bids for the work have been received. It is expected that in the near future the flying field will be leveled off, the wires and poles will be put underground and the entire field put into first-class shape.

A requisition has been issued to grant the club the use of another Navy canvass hangar, the same as is now in use.



The first Martin seaplane, which was built in the early Spring of 1913. Glenn L. Martin is the pilot, and with him are Charles W. Day and Warren S. Eaton, who co-operated with him in designing the Seaplane.



### Baronet Von Figyelnessy to Resume Flying

Harvey W. Kays, manager of Baronet Von Figyelnessy, announces that the Baronet will soon be able to resume flying, his complete recovery and restoration to health being assured. He is not in the Allentown (Pa.) Hospital. "Baron Von Figyelnessy and myself," Mr. Kays writes, "wish to thank, through the medium of *Aerial Age*, their numerous friends for their kind inquiries and thoughtful visits to the Allentown Hospital. It is indeed a pleasure to realize the deep friendship and *esprit de corps* that is shown by the men of our profession."

### Thomas News

During the past week Aviator William Brock has been putting the 1916 Thomas flying boat through its paces. This is the machine which was described in *AERIAL AGE* for October 25th. Flying with it has been practically continuous during favorable weather. On several occasions the boat has been flown over the city, creating much favorable comment on its fine appearance.

Since much of the work of testing is now being done on water machines, a fast hydro-aeroplane tender, with an aviation motor installed, is being built for use on the lake with the machines.

Captain Mark L. Bristol, Director of Naval Aeronautics, recently paid the plant a visit of inspection. The first of the seaplanes for the U. S. Navy and the 135 H.P. Thomas aeromotor received his closest attention. After witnessing a run at full speed of the motor, he expressed himself as being very favorably impressed with it.

### Aerial Stations in Florida

In a letter to the Philadelphia Inquirer Mr. Hugh L. Willoughby, member of the American Society of Aeronautic Engineers, discusses two great commercial projects in Florida—the St. Lucie-Okeechobee Canal and the deepening of the St. Lucie Inlet. After pointing out the strategic value of these improvements in the event of war, he says in part:

"Bases will eventually be established at Pensacola, Tampa, Key West, St. Lucie Inlet and Jacksonville for submarines, and as the aeroplane has proved such a powerful enemy, as well as such a useful friend, these bases will no doubt become 'dual bases.' Bases for aeroplanes should never be more than 200 miles apart, and the shores of the Atlantic and the Gulf must have their separate patrol, as crossing the state of Florida must be made in one flight, as there are very few places in North Florida where landings and starts can be made on account of the pine timber, and in South Florida the Everglades are even a worse proposition.

"Mr. Fowler, the aviator who made the flight from the Pacific to the Atlantic, is the only man that has flown across any



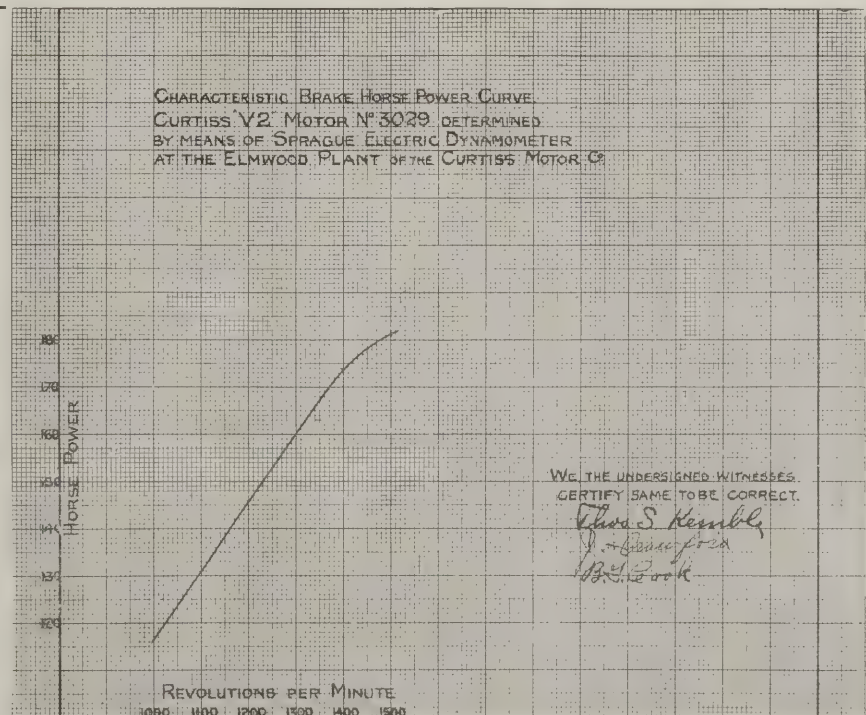
W. F. Sullivan, who qualified for his pilot's license the other day, and who leaves for Bermuda to open a Flying School.

part of the state of Florida. He reported that in the eighty-mile stretch, from Live Oak to Jacksonville, there was absolutely no place for him to make a landing without smashing his machine."

### Mr. Dean Not in Mexican Service

Thomas J. Dean, who was for two and one-half years chief mechanic in the Mexican aerial service, writes to *Aerial Age* that he severed his connection with the Mexican government last September, and hence is not here to make any purchases.

Power chart of the V-2, 160 horsepower Curtiss Motor. As will be seen, the chart starts with 120 horsepower at 1,000 r.p.m. and runs steadily to 182 horsepower at 1,500 r.p.m. From an engineering point of view this curve is a very good one, and long runs on the electric dynamometer and on the test block under its own power showed scarcely any vibration with the motor running as smoothly as a clock.





# CURTISS SAYS TRANSATLANTIC FLIGHT COULD BE MADE TODAY

**G**LENN H. CURTISS when in New York recently, was asked by a representative of the New York World, what dream of the future he was building as a result of the remarkable development of the aeroplane by the war in Europe. With a smile Mr. Curtiss replied:

"I've left off dreaming. Visions of the future are in the repair shops getting new motors; the old couldn't keep up with the pace that plain facts are setting these days. No, we don't dream now; we draw deductions."

So the question was altered to: "Well, what are your deductions as to the future?"

"Recall the facts," returned Mr. Curtiss, "and you can make your own deductions. What are we seeing? In the greater part of Europe to-day the aeroplane and the seaplane, as they call the airboat over there, are playing a large part, a very large part, in what is now the daily life of those sections of the earth. It is not the life of the times of peace, I grant you, but the difference is such that it is really greatly in favor of the future when you ask whether aircraft will remain part of the daily life in Europe after the war."

## Common as Ships

"I'm not going to say that we shall see aeroplanes as common as automobiles on Fifth avenue and Broadway, but they have undoubtedly won their place. Their use in war has proved their utility in peace. As to seaplanes and airboats, I am confident that they will very soon be as common a sight as ships and motor boats are to-day."

"Odd as the idea may seem at the moment, the war will certainly result in knitting the peoples of the world more closely together. The wireless telephone will come apparently immediately peace is established, and that will emphasize the ever increasing feeling for closer relations and the demand for speed in transportation which is a necessary consequence. The seaplane will become an absolute necessity. Its development may, perhaps, be practically without limit."

"As a beginning some one will cross the Atlantic in an airboat the first fine day that the world is again free to take interest in that side of the development of flying. This could be done any day now. Craft is already in existence which could cross the Atlantic in a single non-stop flight."

## The Feat Historic

"Whoever is first to fly across the Atlantic will certainly still accomplish a feat that will be historic. But the flight will not now be a freak performance which might not be repeated in years. So much is such a flight now within the range of daily experience that the man who first does it may not improbably, after a brief rest, turn around and fly back."

"I do not think I am giving away a secret when I say that Rodman Wanamaker, for whom I built the America to fly across the ocean last year, is still as keenly interested as ever in the transatlantic flight. When, after the war had broken out and Lieutenant Porte, who was to have made the attempt at the trans-ocean air trip, was called back to service in England, Mr. Wanamaker was induced to sell the America back to me, it was with the understanding that I would build him another plane to fly the Atlantic, and that will be done at the first possible moment."

"Next time—and we are hoping it will be next year—we shall, I think, start the flight actually from New York City. That in itself will show you something of the development to date. The first leg of the flight will be to St. John's, Newfoundland, and the next to the Azores. The two stops will be more to meet the possible needs of the aviator than the necessities of the machine."

"Before, we were working experimentally and in doubt and darkness. Now we can work and speak with confidence. The second transatlantic flight will, I am pretty sure, cover the ocean in all probability without a stop. It will all depend on the man at the wheel. The machine will easily carry all the supplies necessary for a non-stop flight of that distance together with an allowance as a margin for possible exigencies. Do you wonder that I have left off dreaming?"

## Plan Trial Flights

"To give the aviators the necessary experience in ocean flying we purpose locating the machine here in New York City and making flights along the coast and to sea—at least, such are our present plans. When a man can do, say about 750 miles at the wheel in one spell, the transatlantic flight will present little further difficulty to him."

"And then afterward?" put in the questioner.

"The next deduction should not be hard," replied Mr. Curtiss, and then stopped.

"A regular transatlantic air service—New York to London in thirty-six hours?" was suggested.

"I told you I was doing nothing in the way of visions," returned Mr. Curtiss, with his smile of the Sphinx. "But this I can say with definiteness," he continued. "Experience will show that the seaplane is the safest as well as the speediest of all the means of transit we have. One of our big seaplanes would ride at anchor through the worst of storms, but would more probably get above it and journey on with complete indifference to the weather."

"You asked me what in my opinion are the chief outstanding features of the great experience which the war in Europe is affording us in aviation. I would say that they are these: The increase in the size, but principally in the power of the machines, the amazing work shown to be possible by fliers and, above all, the urgent need of proper and adequate aerial forces for the defense of the United States."

## Lesson for U. S.

"For us I think this last lesson is by far the most important. We have practically no machines and almost no flyers. We could perhaps get the machines, if the enemy was good enough to give us the grace of a little time; but how about the men to use them? It takes time to make a flyer, a lot more time than any foe would give us. The situation is a serious one. No country can afford to take chances these days. Something ought to be done at once."

"Congress has voted \$3,000,000, but most of it, I understand, is going for experimental workshops. That's all right, but it won't produce aviators. As a builder of air craft I shall be considered 'interested,' I suppose. But I will run that risk. I speak because I know. For that matter, everybody ought to know; it is so obvious."

"In the last two naval manoeuvres the defending fleet was eluded each time and the enemy succeeded in landing on our shores. We were told we had not enough scout ships. The obvious fact was that we had no seaplanes. Efficient watch on a long coast line like ours can only be kept by means of seaplanes. The expense of scout ships is unnecessary, and they could not do the work so well no matter how great their number."

"Our entire coast, I believe, should be guarded by a system of seaplane stations. The big seaplanes of to-day can go far out to sea, drop anchor and ride there for days if necessary. They can see infinitely further, their speed is twice or three times that of a scout ship, they can keep in touch with each other more easily, they run little danger from the foe, and are a peril to submarines instead of being in peril from them."

## Seaplane All Eyes

"The seaplane is the only thing from which a submarine cannot escape. To escape from a warship a submarine has but to submerge, and once it is below the surface it is out of sight, and, far from having to flee, can turn back on the warship and have it at its mercy. But experience on the other side is showing that once it is spotted from a seaplane a submarine is doomed as surely as a pigeon over which a hawk is hovering, and from the air it can be spotted and followed even when submerged."

"British aviators have adopted an ingenious, daring and deadly method with the German U-boats when they come upon them submerged. Unseen from the U-boat, they follow aloft until the foe starts to the surface to take a peep around. Then they swoop down and, swishing along the surface of the sea at terrific speed, pass right over the U-boat, breaking off its periscope and leaving it helpless."

"One of the marked features of the seaplanes now is the great strength with which they are built. We no longer use the fine silk that was put on the America, and while I am not favoring metal for the surface of the planes, much of the framework is of metal. I am not at liberty to give dimensions of the biggest machine yet turned out, but I can say it is considerably larger than the America and more than eight times the weight of the machine with which I flew down the Hudson five years ago and won The World's \$10,000 prize for the flight from Albany."

"More important than the increase in size is the increase

(Continued on page 234)



## TYPES OF AEROPLANE CHASSIS

THE three forms of elastic suspension of the alighting gear from the rigid portion of an aeroplane chassis are the rubber shock absorbers, the leaf springs and the coil springs. Of the three forms rubber is most commonly used because it will absorb more energy than steel and because signs of decay or weakness in it are readily discernible. The two other forms are frequently used on very heavy machines, though not to such an extent as is the rubber shock absorber.

In the accompanying illustrations from *Flight* the various forms have been grouped according to the number and the presence or the absence of skids. The chief characteristic of the Farman type of chassis, which is regarded as the progenitor of the wheel and skid combination is that there are two pairs of wheels, each on a short axle slung from the corresponding skid by means of rubber bands.

In turn the skids are supported on a structure of streamline struts extending down from the spars of the lower wing. The arrangement gives a very wide track, which is, of course, another way of saying that it gives a desirable degree of stability when rolling over the surface. The disadvantage is that the shock is transmitted to the spars. The latter factor is not held to be serious, inasmuch as it can to a large extent be overcome by proper bracing with wires or cables.

The sketch of the Caudron chassis shows another double skid chassis, and, like the Farman, the skids are supported on struts from the lower wing, but in the Caudron the skids are extended back to the tail, forming the lower booms of the outrigger carrying the tail planes. That the Caudron quickly pulls up is due to these long skids.

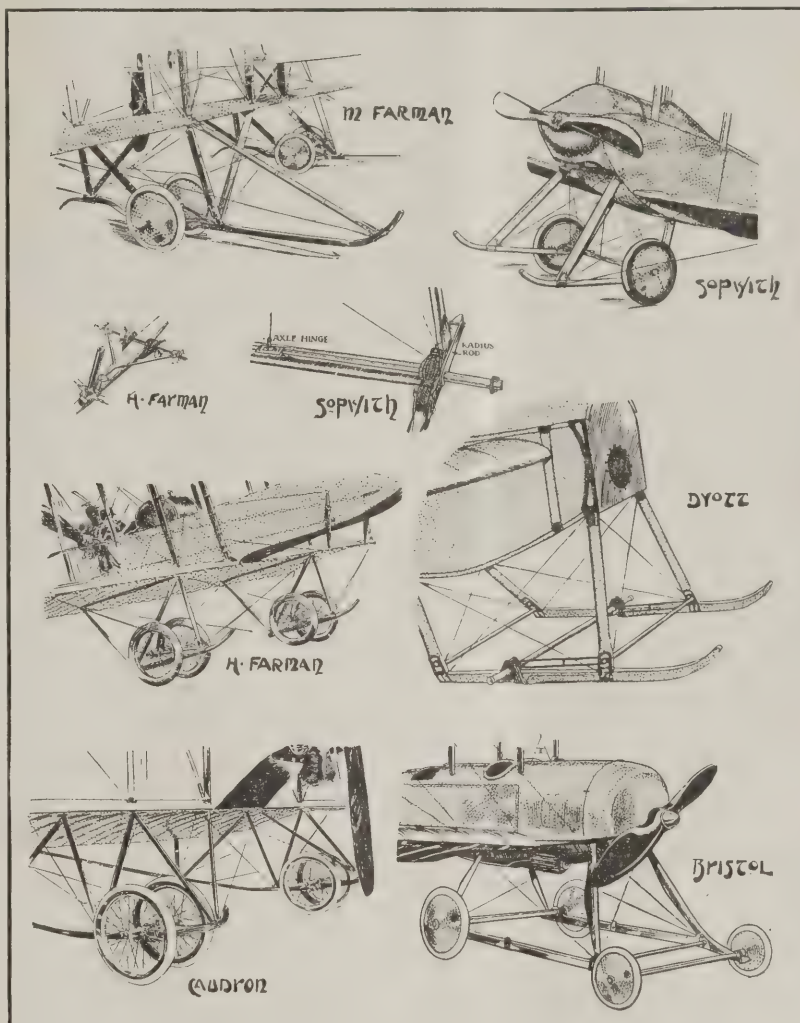
The next three illustrations, while showing a type that is similar to the Farman, in that it has two skids, differs in several details. Chief among the departures from the former type is to be noticed that the chassis struts are not secured to the lower wing but to the body, and the overall width is considerably less than in the type just discussed.

In the Dyott machine the axle runs right across from skid to skid. In the Sopwith Scout the stub axles are pivoted in the center half way between the skids, and move up and down between two transverse members.

In the Dyott machine the front portion of the undercarriage is braced by a transverse compression member and diagonal cross-bracing. In the Sopwith there is no such member, and its place is taken by cables running outward from the skids to the main planes.

The Coanda-Bristol biplane illustrates another form of undercarriage having double skids. The two skids are carried in

the usual way on four struts coming down from the body and a single axis carries the two main alighting wheels. Another pair of wheels of smaller diameter are mounted on an axle slung by rubber bands from a forward projection of the skids



are designed to prevent the machine from turning up on its nose when landing on rough ground.

The trend of construction in undercarriages is toward greater simplicity, at least in the light and the semi-heavy machines.

### The Development of the Aeroplane Tire

From the first type aeroplane tire to the Goodyear Cord is a wonderful advance. The old type aeroplane tire was very costly and uncertain. Present day necessity has compelled tire dependability. Aeroplanes are now larger and heavier—they must carry more passengers and greater loads. This means extra strain on the tires when landing.

Developments in the science of building better tires for aeroplanes have been rapid and revolutionary. In the earlier days tires were given little thought, and all sorts of makeshifts were used. The important thing was to be able to fly, and little thought was given to the business of starting easily and landing safely. Even bicycle tires were used on some of the pioneer machines, and it is needless to say that they were quite unequal to the rough service endured. A little more security was obtained by the use of lugged single tube tires. As machines improved and developed higher speeds in the air with a consequent increase in the speed of starting and landing, even these tires became insufficient and some aeroplane builders went so far as to equip them with full sized automobile tires. These were equal to the occasion as far as reducing the shock of landing was concerned, but were far too heavy and offered too much wind resistance.

About five years ago The Goodyear Tire & Rubber Co. began to develop tires to fit the peculiar requirements of the aeroplane. It was early discovered that resiliency was an

important factor, that a live springy tire actually aided the aeroplane to get off the ground and helped to absorb the shock of landing. This function was found to be so important that the Goodyear engineers at once began to experiment with cord construction, with the result that the Goodyear cord aeroplane tire has to-day been refined to a point that makes it equal in efficiency to its successful big brother for electric vehicles and automobiles.

The modern aeroplane, when it rests on the ground, is supported by wheels that are very small in diameter compared to the cross sectional size, it having been found that small wheels with wide rims affording a broad base for the spokes are well adapted to resist the lateral thrusts that occur when the aeroplane side-swipes the earth in landing. Tires of large cross sectional size are used in order to provide the maximum cushioning ability.

Goodyear Cord Aeroplane tires contain from four to six cord layers—which means extreme reinforcement. The most popular size at present is the 26 x 4 regular clincher. This is the single clinch type. On aeroplanes used for scouting in war, the cross section size is reduced one inch which makes a difference in weight of about five pounds, and permits the carrying of that much more gasoline. This greatly increases the length of time the machine may stay in the air while on scout duty.



# ENGINE POWER AT HIGH ALTITUDES

By NEIL MacCOULL, M.E.

IT is a well-known fact that at high altitudes the air is rarer than at sea level, and that the density of the air decreases at increasing distances above sea level. The density of the air is measured by the weight of one cubic foot, which at sea level and at 62° F. is 0.076 pounds, being equivalent to about 13 cubic feet per pound.

To those who are surprised to think of air as having weight the fact may be demonstrated by the following elementary experiment. Suspend a thin glass globe cemented to a stop-cock from a balance and weigh it. Now exhaust the air from this globe by means of a vacuum pump and close the stop-cock to prevent the air from reentering and weigh it again. It will be found that the globe weighs less than before. Allowing the air to fill the globe again by opening the stopcock restores it to its original weight.

The change in density of the air which is shown in Fig. 1 has an important bearing on the power of an aeroplane engine because of the fact that there is a very close relation between the weight of gasoline and the weight of air for combustion, irrespective of volume. At a given engine speed, with the throttle wide open, the volume of air drawn into the cylinders will be constant and not vary with altitude. It has just been explained that the weight of a given volume of air decreases with increase of altitude, and hence the weight of gasoline drawn into the engine will decrease if the constant ratio, which is known to be best, is maintained between weight of fuel and air. Since the only function of an engine is to convert the energy of the fuel into mechanical energy,

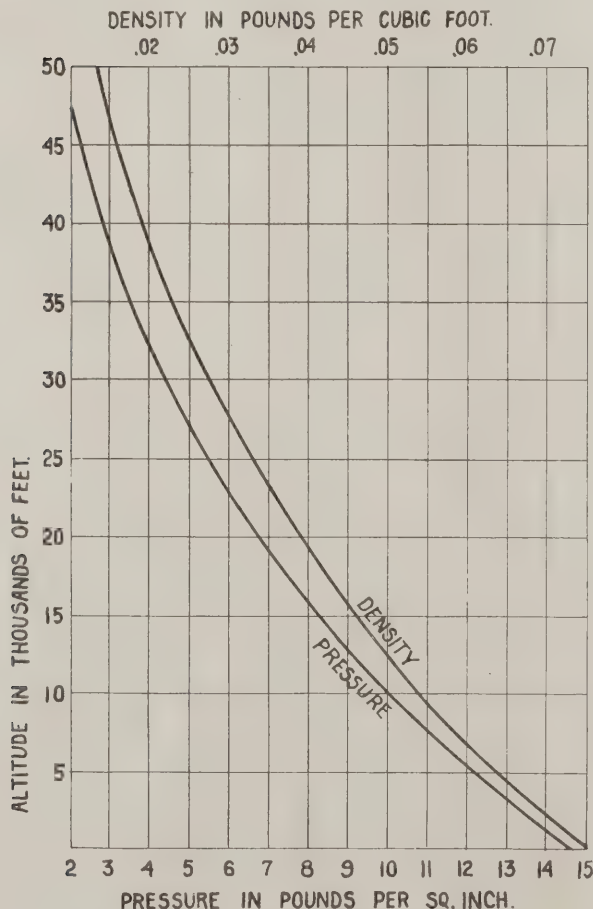


Fig. 1

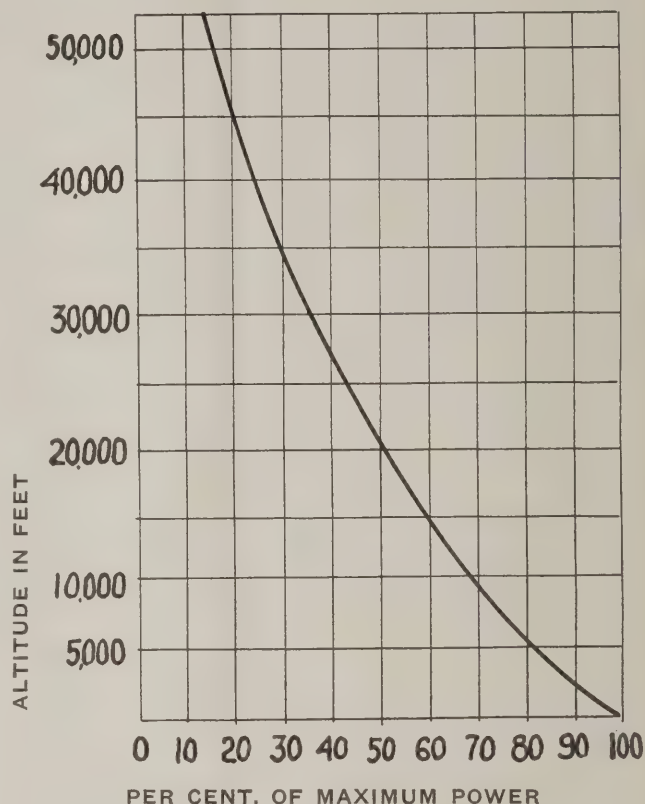


Fig. 2

the power will decrease in a way that is similar to throttling. There is this difference, however, that throttling causes a loss in efficiency, while rarified air does not necessarily, as will be explained later. When the throttle is closed to the point where only enough power is developed to overcome the friction of the engine, *i.e.*, idling speed, the efficiency is obviously zero, since no useful work is being done and yet fuel is being consumed. It is easy to understand that at throttle positions between full load and idling, the efficiency will drop steadily from maximum to zero.

The rate at which power falls off with increase of altitude is shown by Fig. 2, which is based on the variation of density of the air at different altitudes. If the temperature of the air were constant at all altitudes the density would vary at the same rate as the pressure. The density-altitude curve of Fig. 1 has been corrected for temperature changes, as shown in Fig. 3. This temperature curve is taken from volume 42, No. 7 of the U. S. Monthly Weather Review and is fairly representative of the temperature gradient of any point in this country in about 40° latitude, though it is by no means constant. The increase of temperature above an altitude of eleven miles is very interesting.

It will be noticed that the density of the air at an altitude of a little over 20,000 feet is only half as great as at sea level. For this reason the engine of an aeroplane will develop but half as much power, yet greater power is required than at sea level, since a greater speed is necessary in order to support the aeroplane in the rarer air.

Besides the decreased density of the air, there is another cause for lost power, and that is the imperfect carburation caused by the very low temperature of the air found at high altitudes; vaporization of the fuel becoming more and more



difficult as the temperature is lowered. Many aeroplane engines as designed to-day have no adequate provision for warming the air that enters the carbureter, with the result that at high altitudes, and even at sea level in very cold weather, a good deal of fuel reaches the cylinders, not in the form of gas, but as drops suspended in the air, like a fog. The result of this is a slow burning mixture which prevents the engine from developing as much power as it should, and an increased fuel consumption because some of the drops may pass through the cylinders without being even gasified.

The short water jackets provided on some intake pipes and carbureters are not sufficient to warm the air very much because the velocity of the air past the warm region is too great. Any particle of air passes the jacketed section of the carbureter in about 5/1000 of a second, and one can easily realize that this is too short a time for the air to be warmed much, particularly if the wall is heated only to a moderate temperature, as by jacket water. The success of jackets on automobile carbureters in cold weather is not due to the increased temperature of the mixture so much as to the evaporation of liquid fuel which sometimes drains down the intake pipe and enters the cylinders in "slugs," giving an erratic action, if not choking the engine entirely with a mixture too rich to burn. Loss of power resulting from poor carburation is a matter that can be corrected by proper design, and does not offer any theoretical difficulties, but the loss due to decreased charge on account of lowered density of air is a matter which theoretically cannot be prevented. For this reason an engine intended for use at high altitudes

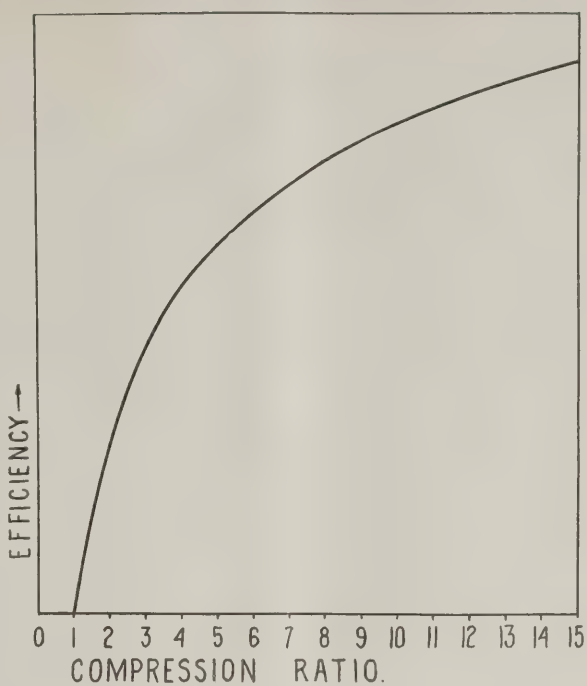


Fig. 4

should be designed for enough excess power to compensate for this loss.

One sometimes hears it suggested that decreasing the compression space, thus increasing the compression pressure, will make up for this loss. Fig. 4 shows how the efficiency of an engine rises with increased compression ratio, and the desirability of using as high a ratio as possible. Higher efficiency in this case means higher power from an engine of course. But the compression ratio of engines as now built is not a quantity that varies, nor can it be varied, as an aeroplane rises to high altitudes—hence the efficiency will not vary either, in spite of the fact that the compression pressure decreases at almost the same rate as the engine power. Any increased power effected by the higher efficiency resulting from high compression ratio will be a gain at sea level as well at sea level or any other altitude? It is the danger of pre-ignition caused by the increased temperature of the mixture resulting from the work of compression. The temperature after compression is given by the following formula:

$$(\text{final temp. F.}) = (\text{initial temp. F.} + 460) (\sqrt[3]{R}) - 460,$$

where  $R$  is the compression ratio; *i.e.*, the final pressure absolute, divided by the initial pressure absolute. It should be borne in mind that the temperature before compression is usually about 200° F. to 300° F. above that of the atmosphere because of heat given to the fresh mixture by the cylinder walls and exhaust gas remaining in the compression space.

This equation shows that changes in altitude have no effect on the allowable compression ratio, except as influenced by the lower temperature of the atmosphere. But the compression ratio must be selected so that an engine will run satisfactorily in the hottest air which it is liable to encounter, unless a variable compression engine is used, or its equivalent. Thus one may conclude that the compression ratio best for sea-level is best for high altitudes also, and vice-versa.

Another means by which it has been attempted to compensate for the power lost at high altitudes is to supply the mixture to the carbureter under a slight pressure by means of a blower. This causes a slight increase in the charge of gas taken by the cylinders, but any gain in this respect at high altitudes will be a gain at sea level also. Hence there is no way by which it is possible to prevent the maximum power of an engine at high altitudes from being less than the maximum power of the same engine at sea level, and in deciding on the size of an engine required by an aeroplane this must be taken into consideration.

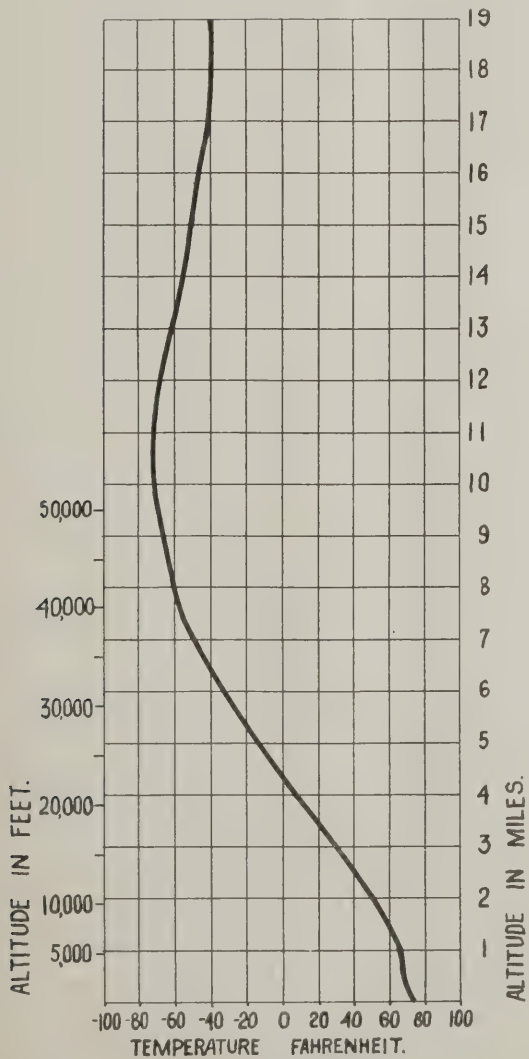


Fig. 3



# RECENT AERO PATENTS

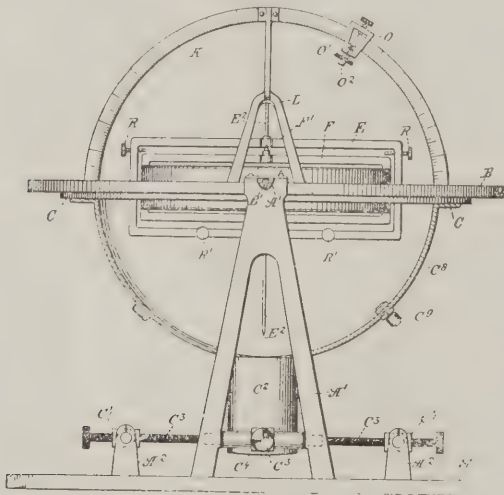
BY WILLIAM N. MOORE

1,137,258. GYROSCOPIC COMPASS. ALEXANDER S. CHESSIN, New York, N. Y. Filed Dec. 14, 1908. Serial No. 467,361. (Cl. 73—151.)

1. The combination of a support having a universal suspension, a frame, means for effecting a universal connection of said frame with said support, a gyroscope rotor mounted to rotate in said frame, an arc, adjustable circumferentially of the support, to serve as a guide in positioning the rotor, and means, adjustable on said arc, for bringing the rotor's axis to a predetermined position.

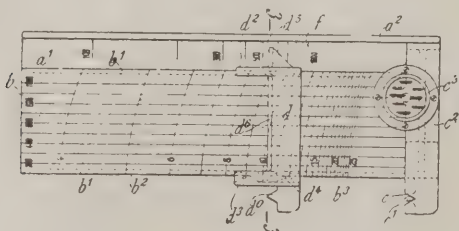
2. The combination of a support, means for effecting a universal suspension of said support, a frame, means for effecting a universal connection of said frame with said support, a gyroscope rotor mounted to rotate in said frame, an arc, adjustable circumferentially of the support, to serve as a guide in positioning the rotor, and a clamp on said arc for holding the rotor in its adjusted position.

3. The combination of a support, means for effecting a universal suspension of said support, a frame, means for effecting a universal connection of said frame with said support, a gyroscope rotor mounted to rotate in said frame, an arc adjustable circumferentially of said support, to serve as a guide in positioning the rotor, and means for holding the rotor in its adjusted position.



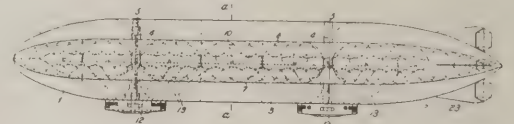
1,143,719. SIGHTING INSTRUMENT FOR AERIAL USE. OTTO MACKENSEN, Jena, Germany, assignor to the Firm of Carl Zeiss, Jena, Germany. Filed Mar. 24, 1914. Serial No. 826,888. (Cl. 33—46.)

In a sighting instrument for aerial use means for sighting in directions variably inclined to the vertical, a member bearing graduations representing height values, an index connected with the said sighting means, the said member and the said index being adapted for relative movement, a second member bearing graduations representing height values and time values and a second index also connected with the said sighting means, the latter member and index being also adapted for relative movement, which latter relative movement is dependent on the relative movement of the first named member and index.



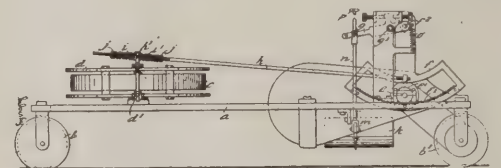
1,144,578. AIRSHIP. IVAN ANDERSSON, New York, N. Y. Filed Nov. 12, 1914. Serial No. 871,814. (Cl. 244—6.)

1. In an airship, an aerostat comprising a plurality of independent non-rigid sections, rigid vertical frames interposed between adjacent sections, platforms carried by said frames at the upper part of the aerostat, propellers carried by said frames, and means for holding the aerostat sections and the frames assembled.



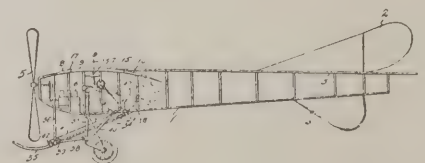
1,137,234. GYROSCOPE. PETER SCHILOWSKY, Simbirsk, Russia. Filed Mar. 1, 1910. Serial No. 546,681. (Cl. 74—78.)

1. Means for imparting lateral stability to a body naturally unstable, comprising a rotating gyroscope wheel, a frame supporting the wheel and pivotally mounted on the body with its pivot axis transverse to the line of support of the body, and in a plane lying between the said line of support and the center of gravity of the wheel, a constantly acting source of power and mechanism adapted to transmit intermittently impulses from the source of power to the frame at the moment oscillating, said mechanism comprising a transmitting member connected to the frame, and means on the body independent of and entirely separate from the gyroscope frame automatically operating when the body oscillates in one direction about its line of support, to cause a driving connection between the said member and the constantly acting source of power.



1,152,743. AEROPLANE. FRANK MCCARROLL, Dallas, Tex. Filed Nov. 3, 1911. Serial No. 658,328. (Cl. 244—2.)

1. A running gear for aeroplanes, comprising in combination with a framework, an inclined slide member carried by said frame, a carriage on said inclined slide member, wheel supports pivoted to the sides of the frame, means operatively connecting said wheel-supports and said carriage, whereby when said carriage is moved upwardly on said slide-member, said wheels are carried into said frame, and means for operating said slide.







# FOREIGN NEWS



## AUSTRIA

The War Office reports that in the Italian theatre of war several civilians, among them one woman and two children, were killed by aerial bombs dropped on Nabresina.

## FRANCE

The French aerial fleet has been developed to such an extent that now it is organized with the precision of a fleet. The "esquadrille" to which frequent reference is made in French journals is the unit of the aerial organization. The esquadrille is now made up practically as follows:

Six scout-aeros (avions d'observation.)

Two armed cruiser-aeros with three-inch gun (avions de chasse.)

One battle-plane with two three-inch guns and one mitrailleuse (avion de combat.)

Nine lorries, nine trailers, nine portable canvas aero-sheds, three autos.

There is one lorry and trailer and one shed for each of the fighting craft, so as to transport it rapidly to any point and house it until needed. The autos are for the commanding officers and to follow up the fliers when possible. Gasoline, tools, supplies, etc., are carried on the lorries.

The "esquadrille" thus made up is commanded by a commissioned officer of the army, who acts as pilot of the squadron. Commissioned officers also operate the fighting and cruising aeros, with expert non-commissioned officers and soldiers for the lesser craft. Including the soldiers on the lorries, trailers, etc., an "esquadrille" has a complement of upward of seventy officers and men, of which, however, only a dozen or so are actual fliers.

One of the most useful devices in the French aeronautic service was discovered from the capture of a hostile aeroplane—an instrument made by an optical firm in Berlin. The instrument records with exactness the moment and place when an aeroplane is precisely vertical above a given point on the ground below. That is, there is no trusting to the eye, and when the instrument shows the vertical point—as, for example, an enemy battery below—a bomb dropped from the aeroplane is certain to hit that exact point. It is, in fact, an aerial range finder, showing the exact moment when a bomb will strike a given spot.

A modification of the old American Indian system of telegraphing by smoke is used by airmen to send back to their artillery information concerning the range of the big guns. Twelve small glass bottles are set in a rack within easy reach of the aviator. Each bottle contains a liquid which explodes five seconds after the cork is pulled, emitting either a round puff of smoke or a trail of smoke. The former is read by the watchers as a dot and the trail of smoke is read as a dash. Thus to a limited extent can the aviator telegraph the effect of shots, and give artillerymen sufficient information with which to correct the range if necessary.

## GERMANY

A Zeppelin recently flew from Tamesvar, in Hungary 72 miles north-west of Belgrade, across southern Hungary, Northeastern Serbia and Northwestern Bulgaria to Sofia, making the trip in eight hours.

"The Zeppelin had the Duke of Mecklenburg on board," says the despatch. "The airship was inspected by King Ferdinand directly after its arrival. The King was accompanied by members of the Ministry and an immense crowd had assembled to greet the German flier. 'This is one of the great moments of my life,' King Ferdinand exclaimed, as he welcomed the crew of the airship and its distinguished passenger. The Zeppelin, after virtually all Sofia had seen and admired it, started on its return voyage."

The Rotterdam correspondent of the London Daily Telegraph claims to have absolute information to the effect that Germany is devoting more energy to the construction of Zeppelins than ever before. In a score or more widely separated places the construction of Zeppelin dirigible balloons is being carried out, and that in no department of constructional work in Germany is greater activity being shown.

Dirigibles of all types—Zeppelin, Parseval, and Schutte—are being turned out with feverish haste, the correspondent understands. New sheds are being built, not, as formerly, of easily combustible wood, but of iron, including roofs of the same material, as a protection against aircraft attacks. The Krupps also are said to be engaged in building portable sheds.

From all the correspondent was able to learn, the idea is to bring the war home to the English people, who, hitherto, "have not felt its effects, so that they shall be more anxious for peace."

Two German aeroplanes attacked and seriously damaged a British patrol ship off north Hinder Lightship in the North Sea on Nov. 6. The aeroplane pilots dropped two bombs on the steamer, believed to be the Cotteler and flames were seen to rise from the ship as the aeroplanes departed.

Lieut. Ingelmann, Germany's celebrated air fighter, has been credited by the War Office with the destruction of six hostile machines. The official bulletin says:

"Lieut. Inglemann yesterday shot down his sixth enemy aeroplane west of Douai (in French Flanders). The machine was an English Bristol biplane, armed with three machine guns."

In the western theater of war two English aeroplanes were shot down in an aerial duel and a third hostile plane was obliged to land behind the German lines.

## GREAT BRITAIN

Field Marshal Sir John French reports the following sky battles:

"On the 7th our aeroplanes bombed German huts, with apparently good effect. As a result of a protective air fight the same day, a German machine overturned and fell inside the enemy's lines from a height of 7,000 feet. In another fight near Douai we lost an aeroplane."

The Lord Mayor's show in London on Nov. 9 savored little of pagantry but much of the stern realities of war. All branches of the service were included in the parade, among them being air-craft and the latest anti-aircraft guns.

In the great government airship plant at Farnborough, not far from London 3,000 persons are employed day and night in turning out airships of whatever type that the government wants. A newspaper correspondent describes it as a gigantic experiment station where certain types are first built and then contracts are let to other manufacturers. Among the employees are hundreds of women and girls who are happy in the realization that they are engaged in work useful to their country. Many loyal women have found work in England, wherever aircraft are made and they are said to be particularly adaptable to some tasks in connection with the building of airships.

## ITALY

The fortified city of Verona, one of the most picturesque places in Italy, and the scene of two of Shakespeare's works, has been shelled by three Austrian aeroplanes. Thirty persons were killed, thirty were wounded seriously, and nineteen were wounded slightly. Most of the victims were in the market places and many of them were peasants from outlying districts who had come in to do their trading. The planes visited all parts of the city and dropped bombs, but none of the missiles struck any of the military buildings. This is the second attack made on Verona, the first having occurred last July.

One of our dirigibles, the War Office reports, on the night of the 8th, after rising above a dense bank of clouds, crossed the Isonzo zone and Vipacco, and then bombarded intrenchments in the vicinity of Savogna. The dirigible was discovered by the enemy's searchlights but eluded the fire of anti-aircraft guns and returned unscathed to our lines.

## MONTENEGRO

An Austrian aeroplane fell within the lines and an officer and a non-commissioned officer who were aboard were taken prisoners.

## SWITZERLAND

The German government has notified Switzerland that the bombardment of Chaux-de-Fonds by a German aeroplane was due to the circumstance that the pilot had lost his bearings and believed that he was over French territory. Both aviator and observer had been transferred and punished, and all serving in the German aviation corps have been notified not to throw bombs excepting when they are, without any possible doubt, over enemy territory.

## TURKEY

The Turkish War office announces that a hostile aeroplane was brought down by Turkish gunners near Anafarta. It fell into the sea and was towed away.

## ZANZIBAR

The government of Zanzibar has presented 10,000 pounds toward the expenses of the war, and announcement is made in London that this fund is to be spent in providing four fighting aeroplanes which will be named "Zanzibar No. I," "II," "III" and "IV" respectively.



Apparatus to Catch the Sound of Aerial Motors.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1363 Townsend Avenue, Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 130, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**SPRINGFIELD MODEL AERO CLUB**  
Springfield, Mass.  
**MILWAUKEE MODEL AERO CLUB**  
402 Bradford Avenue, Milwaukee, Wis.  
**CONCORD MODEL AERO CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**PLATTSBURG MODEL AERO CLUB**  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### Oxford Model Aero Club By WILLIAM LAWRIE.

Although little has been done lately in the construction of new models, several new club records have been made. During the county fair three records were made, viz.:—Hand-launched duration, 161 sec. (club record); single tractor biplane R. O. G., 76 sec. (world record), and twin pusher biplane R. O. G., 143 sec. (world record).

The odd part of the meet was that no new models made any records, the three models having been made for exhibition purposes and were constructed some time ago.

The weather was ideal, which no doubt, was the cause of such consistent flying. Another strange thing at a model meet was the fact that there was not a single breakage in the entire meet.

The Twin Pusher Biplane, now holding the club duration record for this type of model, is specified as follows:

Frame of eye-beams, 48 inches in length, spaced by cross pieces 11½ inches, which with the bearing blocks used makes the propellers clear one-half inch.

Twelve inches expanding pitch racing propellers, mounted on ball-bearing shafts.

Main plane, upper 34 inches; lower, 26 by 5 inches.

Elevator, 14 by 5 inches. All planes single surfaced.

Cork wheels, one inch in diameter.

The flat rubber being lubricated with a coat of dope made by glycerine, castile soap and water.

The model rose from the dirt infield of the baseball diamond, not using the regular starting board of the club, against a very light breeze, and circled the field in wide circles, gaining altitude very fast every time it flew against and across the wind. The flight was beautiful, but the glide was wonderful. After 59 seconds of flight the power gave out, the remainder was glide. The model is a very slow and graceful flyer. The flight ended on the race track with the wind behind it, and made a perfect landing.

The photo taken of this model was before it was re-modeled by Mr. Wheeler, it having had the weight cut to less than half by taking off the heavy wire wheels and putting cork ones in their place, and by making the front

plane single instead of a biplane surface as in the photo. He also took off the large heavy propellers and replaced them with lighter and smaller ones of greater pitch.

The club misses the moving spirit of the club. Mr. Alson H. Wheeler, who is now studying micrometer lathe work with the intention of developing a compressed air motor for the club. The club's president was one of the most consistent flyers at the recent fair meet.

### Aero Science Club of America

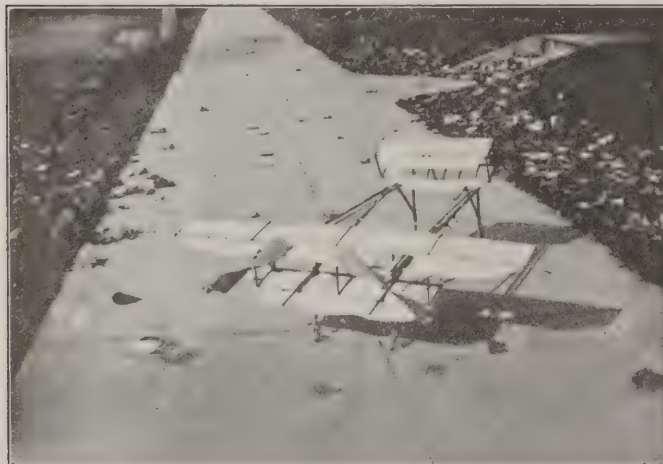
At the last meeting motors for model aeroplanes were the subject of discussion. The subject was thoroughly discussed by Messrs. Durant, Hodgins, Parker and Lauder, and like the discussion of the aeroplane propeller at the previous meeting the discussion of the motor was interesting and informative. After the discussion Mr. Parker stated that he was preparing to make a gasoline motor for model work. Those members who are now building motors for models and who anticipate taking part in the efficiency contest are Messrs. Schober, Funk, Hodgins, Meyers, Parker, McMahon, Lott and Barker.

Regarding the intentions of the Y. M. C. A. of Orange, N. J., to establish a class of interested young men, and to have an expert on hand to give practical lectures and demonstrations on the construction and flying of models, the club at the last meeting stated its willingness to assist the Y. M. C. A. and to loan a number of models for exhibition purposes.

The publicity committee of the club, of which Mr. Schultz is chairman, is doing good work. A number of new members have been enrolled during the past few weeks, and a number of people in different cities in the United States and Canada have expressed their desires to establish clubs in their respective cities. These have been taken care of, and indications are that the coming year will eclipse previous years with respect to model activity.

For further particulars, address the Secretary, 29 West Thirty-ninth street, New York City.

(Continued on page 235)



The models shown in the accompanying photographs were constructed by members of the Model Aero Club of Oxford, Pennsylvania. Both these machines have established world's records. The Twin Screw Pusher Biplane, after rising from the ground, made a duration of 143 Seconds. The single Tractor Biplane made a duration of 76 Seconds. The establishing of these records with models of these types clearly indicates the scientific progress of model constructors and flyers.





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### The Preparedness of Jinks

I.

Old Congressman Jinks of the great middle West,  
The district he honors you'll find on the map,  
For years for his neighbors has striven his best  
To get 'em their share of the national pap.

II.

Our army and navy he doesn't admire;  
Incentives to warfare they seem to his eyes.  
The things for a Jinks and his kind to acquire  
Are pieces of pork of an adequate size.

III.

To monkey with airships at millions a year  
Is hunting for trouble at Jink's expense.  
There's mud in the creeks of his district. He'd clear  
These waters of boulders with dollars and sense.

IV.

"For what could they do?" queries Jinks with a smile,  
"To me and my neighbors so far from the sea?  
We've got an old cannon can carry a mile,  
Our war record's good. They'd best let us be!"

An instance of how German frightfulness in the shape of Zeppelin visits affects our young folks may be told. The small son of a near neighbor was asleep in his bed when the first air battle began last week. His parents thought it would be well to remove him to their own bed. He awoke during the process of removal, and asked "what was the matter?" He was told that the Zeppelins had come. He replied:

"If they have, that's no reason why I should warm someone else's bed."—*Daily Chronicle* "Office Window."

#### Aeronitis

Confound it, said the mechanic, I can't even get this engine to move. It has always been my experience, said the aviator, that engines work better when you "Gnome."

Willis—What do you think the result of getting Edison, Wright and Ford on the Naval Board will be?

Gillis—The invention of a naval aeroplane run by electricity that will sell \$460 f. o. b. Detroit.—*N. Y. World*.

But—Say! How did you come to marry an heiress?

Nut—Why, that was easy; I just glided into her affections.

#### An Exception

The higher up people get, the less they are inclined to envy their fellows.

I don't think that applies to Zeppelins.

The aeroplane is a constant source of expense, isn't it? asked the pilot.

I don't know. I never discuss those things with the friends who place their machines at my service.

Say, Bill, what was you trying to do this morning with that big crowd around?

Friend—O! I was just trying to get up "aloan."

We advanced crabwise, jumping from cloud to cloud. We waltzed home delirious with joy, photographing each other on the way.

Only the simple story of a French aviator. Ten years ago it would have been accepted as positive proof of delirium tremens.—*Evening Mail*.

Prue—Do you think aeroplaning has improved your health?

Dolly—It has strengthened my lungs. Charlie can now hear what I say to him without reducing his speed.

#### Johnny Get the Gun

"Mike," sez Lanigan, "do you know why Eve couldn't run a Tin Lizzie?"

"Spring it, Lanigan," sez I, with a weary smile, "cheer me up with another of y'r old chestnuts, I'm game."

"Because," sez Lanigan, "because she lacked a-tire!"—*M. K.*

#### Starting Something

Willis—I'm a ruined man! Today, when the family were all together, a man opened the door and threw in—

Gillis—A bomb?

Willis—Worse than that; an aeroplane catalogue!

#### The Way of It

A Zeppelin was shattered by an English scout,  
And now the poor Germans are a Zeppel out.

F. P. PITZER.

Sir: The maximum speed of a 28-pound projectile is 18,937 feet per second on a clear day. In a rainstorm the falling drops retard the movement 1-390,000,000th of an inch every eleven feet. How long would it take for such a projectile to travel a mile and a half on a cloudy day?—*A. Nutt*.

Did you notice what a cool Fall we seem to be having—*Ed*.

#### Signs of the Times

A big headline in the paper, it is a sign some other genius has drawn up a plan of a jitney dreadnought or a jitney fortress or a jitney Zeppelin, or some such thing.

#### False Vows

"Be mine, Estelle," begged the aeronaut as he soared through the moonlit sky, "and I swear by yon silvery moon that nothing shall ever come between us."

"I will trust you, Adelbert," she whispered, and so they were married.

But, alas, for the vows of man. Before three years had passed something had come between them.

Its name was Myrtle, and Estelle and Adelbert each had it by the hand!

#### A Handicap

Why did you marry Jinks? I thought you said Blinks was the finest man that walked.

But Jinks had a flying boat.



—Courtesy *Flight*.



### Signal Corps School at San Diego

Lieutenant Herbert A. Dargue, Aviation Section, Signal Corps, entered the contest for the Curtiss Marine Flying Trophy, on October 22. He had flown 192 miles when magnet trouble developed, causing him to land in the ocean. It required the whole day to repair his motor, and he was not able to rise from the water until about 5:30 p. m. He flew by moonlight from San Juan Capistrano, Cal., to San Diego, Cal., and landed in the bay without mishap.

On October 27 Messrs. Oscar A. Brindley and Raymund V. Morris entered the contest for the Curtiss Marine Flying Trophy. Mr. Brindley flew a Martin hydroaeroplane and Mr. Morris flew his monoplane flying boat, which had just been altered to a biplane flying boat. Over San Pedro Bay near Los Angeles the propeller came off Mr. Morris' machine and cut away the control wires to his left elevator, in addition to slightly disturbing his other controls. He landed safely in the bay. Mr. Brindley flew over a circuit course and covered in all 554 miles. After deducting the 5 per cent. which is to be deducted for following such a course, Mr. Brindley still has 526 miles to his credit.

On October 31, Mr. Morris, using a Curtiss flying boat, again entered the contest for the Curtiss Marine Flying Trophy, and covered 501 miles net. His flight of this date was one of the pluckiest during the entire contest. All day he was hampered by annoying fogs and time after time his flight was impeded by them.

Second Lieutenant J. W. Heard, Fourteenth Cavalry, has reported for duty as an aviation student, and Lieutenant Herbert A. Dargue has left the station on a month's leave of absence.

### Aviation News in Detroit

Jay D. Smith is in Detroit for a while. He came to the city to fly the Janus boat for C. Van Huesan and W. E. Davidson, but unfortunately did not have a chance to try it. Ed. Korn took the boat out for a try and had an unfortunate accident in which it was wrecked beyond repair. Mr. Korn had been used to the Curtiss type control in the Maxi, and this is supposed to have been the reason of the accident, as the Janus boat had the Benoist control. Mr. Smith was quite disappointed; however, he took the Maxi plane and did some nice work while Mr. Korn was nursing injuries received in the accident. This was also Mr. Smith's first experience with the Curtiss control, and he was quite at home with it.

Mr. Van Huesan is already building a new machine.

Barton L. Peck has dismantled his flying boat for the winter and will go to Florida soon.

The Maximotor Co. have installed a Maximotor "8" in the Maxi-boat-plane and are carrying passengers as well as demonstrating their engine. They are also building a tractor land machine to be powered with a Maxi "6." The tractor will soon be completed.

W. S. Martin is constructing a Curtiss type flying boat for his personal use next season. The plane will have a span of 42 feet and be powered with a Curtiss O X engine.

### Three Airships Hovered Over the Noordam

The Holland-American liner Noordam, which reached New York on November 13, was subjected to an inspection by three German Taubes shortly after she left Rotterdam, and the passengers, fearing an attack, had an anxious half hour until the captain satisfied the airmen that his was a neutral vessel. The three airmen appeared in the wake of the ship and soon caught up with her. Then they circled overhead, as if undecided as to their course of action. The captain spread huge Dutch flags on the forward and after decks, whereupon the aerial warriors flew away toward the shore. Soon, however, one of them retraced his course, and, catching up with the ship, came so close that the pilots could be seen by those on shipboard. Then apparently satisfied this Taube hastened away to rejoin its companions.

### E. K. Jaquith Goes to Fort McHenry

E. K. Jaquith, of Chicago, who has been carrying passengers at Atlantic City during the last summer, has secured the permission of the authorities to establish a school of aviation and a passenger carrying hydro-aeroplane near Fort McHenry, Baltimore. Mr. Jaquith pronounces the location secured to be ideal. Baltimoreans are greatly interested in the new school and many applications were made for the privilege of a flight even before the right to a landing place had been secured. In the last three years Aviator Jaquith has, it is declared, taken up 3,000 persons in his flying boat.

### The Balloon Boston Made 35 Miles

The New England Aero Club's balloon, the Boston, with John L. Van Valkenburgh, of Farmington, Mass., as pilot, and Henry V. Brady, of the same town, as passenger, ascended at Aero Park, Worcester, and landed in the town of Phillipston, covering 35 miles. The trip was uneventful, and the landing was easily made under ideal conditions.

It was the eighteenth trip for Mr. Van Valkenburgh and the fourth for his companion. They had hoped to make more than 45 miles, thus gaining the distinction of the longest flight from Worcester, but in this they were disappointed.

### An Aid to Efficient Ignition

The Carter Spark Plug Detector is the latest patented device now being placed on the market by the Carter Spark Plug Detector Co., of Detroit, Michigan.

This automatic instrument is very simple in operation, and anyone not experienced with the ignition system of gasoline engines can quickly determine the spark plugs that are firing from those that are missing.

This instantly places the motorist at the very root of motor troubles by proving out the spark plugs first, thus eliminating the uneven running of the motor and finding and replacing the missing plugs with clean ones.

This is the latest invention of H. O. Carter, who has designed a number of successful cars during the past ten years and has found that prevailing custom among the great majority of gasoline engine users is to condemn the carburetor first, while the ignition system, with its complications, is the last to be examined.

(Continued from page 226)

in reserve engine power. On the America we had two motors of 90 horsepower each, but they developed only 80 horsepower, or together 160. On a similar machine to-day we put two 160 horsepower motors.

### Aeroplane That's Safe

"Were we now building for peace purposes we could build enormously larger machines than we are turning out. But in war machines very high speed is essential rather than size. It is absolutely necessary, of course, that air craft in war shall be able to rise very speedily. The perils of war are evolving an aeroplane that is as safe, apart from war perils, as a coach on a paved road.

"Among the war flyers of the allies the mishaps essentially aeronautical—that is, not due to war conditions—have been fewer, I understand, than accidents among a similar number of automobiles. Taken altogether, the losses in the flying corps have been remarkably light compared with the amount of flying done and the risks run.

"Records of their work show that some of the men we trained have been in the air more than one thousand hours in less than a year, and one of them has recorded 1,200 hours aloft, which means more than four hours a day in the air over the foe without being hit or having a mishap to his machine. Some of the escapes have been miraculous. From one flight a man returned with more than a hundred bullet holes in his planes, but he had not been hit.

"Two other developments illustrate the inherent reliability of the aeroplane to-day. The first is that flight is now made with safety no matter how rough a wind is blowing. Weather no longer counts. The other is that, though in peace flight over a city was forbidden because of its danger, cities are now being protected by aeroplanes and we have not heard of any disaster through a machine falling.

"I am often asked why the British flyers cannot protect London from the Zeppelins. My answer is that that is expecting too much. It is impossible. The truth is that they are so far protecting London that the Zeppelins dare not venture near in the daylight and can make their raids only under cover of a dark night. Even at night the raiders have to turn back if the sky is cloudless.

"But even if the aeroplanes were already hovering high over the city when the Zeppelins came the chances would be in favor of the raiders. It would be possible to fly quite close to a Zeppelin and not know it. If you did happen to see it, the next moment it would be lost in a cloud. If, as must be the usual case, the defenders have to wait on the ground until the Zeppelin is picked up by a searchlight, the raiders will have done their work and be fleeing at top speed before an aeroplane can reach their height.

"The Germans say they make their raids at an elevation of 3,000 feet, but I believe 8,000 feet is nearer the mark. That is why they escape the guns. Londoners will have to bear with the raids as part of the fortunes of war. They can put out their lights, but they cannot hide their river."



### Domenjoz Flies from Sheepshead Speedway and Loops over Statue of Liberty

On Tuesday of last week John Domenjoz, the Swiss aviator, who gave exhibition flights at the Sheepshead Bay Speedway on Election Day, flew from the Speedway to the Statue of Liberty.

He left Sheepshead Bay Track at 2:45 P. M. in his Bleriot monoplane equipped with a 60 h.p. "Gnome" motor. He was flying against the wind and did not make more than forty miles per hour to New York. It took him twenty minutes to arrive at the Statue of Liberty. He made two loops (over on top of) the Statue of Liberty at a height of 1,000 feet, where it was very cold and he was numbed by the cold; this is the reason why he landed on Governors Island. He made a perfect landing where he remained five minutes. He was congratulated by the officers and soldiers and two soldiers held his machine while another one turned his propeller when he flew away. After leaving Governors Island he circled the Bay and made two more loops over the Statue of Liberty. On the downward end of the last loop he lost his aviator helmet and goggles. He managed to replace his goggles and finished his flight without his cap, which of course made the cold weather still harder to endure. On his return to the Sheepshead Bay Track he made a speed of 150 miles per hour. He landed on the Track safely at 3:45.

(Continued from page 232)

#### Illinois Model Aero Club

BY WARD PEASE

Friday, November 12, we held a very successful speakers' meeting at the Auditorium Hotel. It was held under the leadership of Mr. Arens, chairman of the social activities committee, and the attendance was quite good. Arthur Nealy spoke on the history of the club from the time when he won the first meet in January, 1912, with 90 feet, to our present successes, when Hittle can get a tractor hydro to fly for 116 seconds, and Lathrop, with a hand-launched tractor, sets an official duration record of 240 seconds and an unofficial distance record of at least a mile. Ward Pease, chairman of the contest committee, spoke of the Milwaukee meets, and the national competition and the records that the club holds. He mentioned that the I. M. A. C. holds four world's records, and one American record. Hittle spoke of the scientific methods used in the club that make these records possible. George Weaver gave a very humorous account of his and Laird's experiences on the road during Laird's exhibition season. Laird spoke on how model building had helped him to his present success, and how grateful he was for the help given him by the club and its members. Mr. Dickinson, the president of the Aero Club of Illinois, and our club's best friend, spoke of his various experiences flying with various aviators, and especially his first ride in a tractor which he had at Ashbourne recently with E. L. Partridge, who has been building aeroplanes in Chicago for several years, and now has learned to fly them.

Sunday, November 14, Laird is going to fly for his pilot's license, and at the same time there is going to be an R. O. G. meet, and nearly the whole club will be there.

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Describing why aeroplanes fly, How to make Models, and all about Aircraft, Little and big. By A. Hyatt Verrill. Price, \$1.00.

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A simple account of how the weather comes about; of its changes of aspect from season to season; of the signs which announce its activity, with scientific explanation of winds, storms, floods, cyclones, droughts, blizzards, hot-waves, etc. By E. C. Martin. Price, \$1.25.

## AERIAL AGE WEEKLY

116 West 32nd Street

New York City

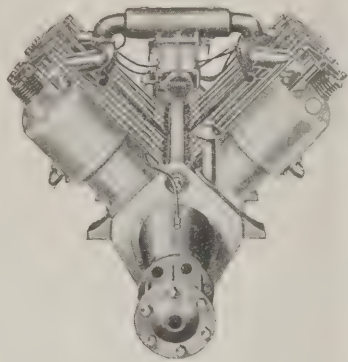
## Gallaudet Aero Varnish

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Use at least three coats, applied quickly, with a brush about two inches wide, and allow one hour for drying each coat. **Price, \$3.85 per gallon,** plus cost of cans or barrels.

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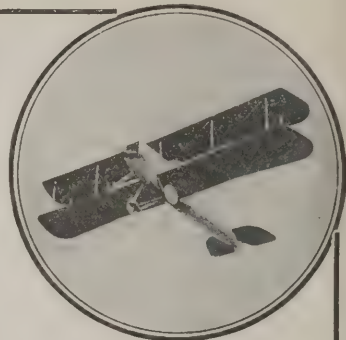
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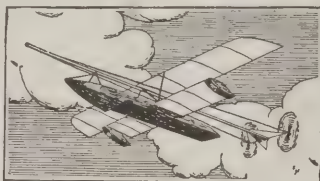
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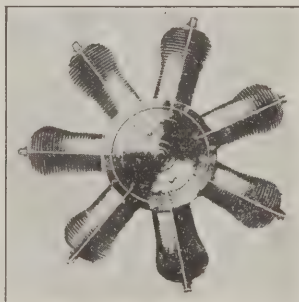
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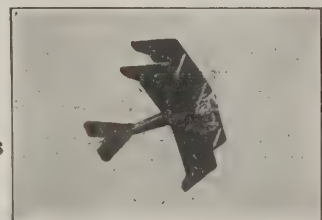
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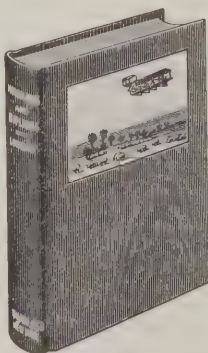
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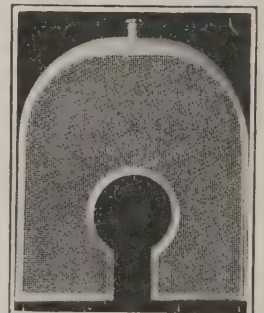
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VOL. II

NEW YORK, November 29, 1915

No. 11

## Problem of Getting Suitable Steel for Aeronautical Motors and Magnetos Solved

**A**ERICAN steel manufacturers finally have succeeded in equaling the best product of the famous Krupp works at Essen. A report issued.

In addition to this American magneto makers have perfected a magneto which is equal, if not superior, to the best ever made in Germany. Hitherto the German magnetos have been the finest and most efficient in the world, and American makers of motors have been forced to depend on them.

The Krupp supremacy in the manufacture of certain types of steel, particularly the alloys used in the manufacture of crankshafts and other vital parts of motors, where the greatest strength, combined with the least weight, is desired, has been maintained in past years, and until the beginning of the war by economic competition made possible by the fact that the Krupp people were subsidized by the German Government and could, therefore, underbid other steel concerns who had to depend on straight business for their existence.

When the war was well under way the American motor makers suddenly found themselves in a very embarrassing position. The German Government refused to allow the Krupp works to export any of their product. For years American manufacturers had depended on the Krupp works for certain brands of steel, and suddenly the supply was cut off.

The Krupp works had contracted to supply this country with large quantities of this high-power steel, and now it is known that this was really done for the purpose of preventing the American manufacturers from attempting to make it.

The motor makers were facing the ruin of their business when they found that the small stocks in hand were the only steel that they had to go on with, and they issued calls for help to the various big steel mills. The result was that practically every one of the greater plants set to work to duplicate, if not better, the German product. Some of them have been working for ten months, others for the last six, and after numberless experiments, at fewest six of the great mills have succeeded in turning out an alloy that is, if anything, superior to the best that ever was exported to this country from the Krupp works.

Until the last few weeks the crankshaft and other high-grade steel turned out by the steel mills here were of very uncertain quality. Only about one piece in ten really lived up to the requirements, and the motor makers were having an awful time with it. Now, however, they can be sure of what they are using. Aviation motors are like the highest priced watches. One-one-thousandth of an inch makes all the difference between a motor and a piece of junk, and steel that will stand the terrific strain is an absolute necessity.

In regard to the magnetos, the same condition existed after the war began as existed in the case of steel. German magnetos were no longer imported, and the motor makers were at a handicap. None of the American magnetos was as good as the German, and the efficiency of the motor is practically that of its magneto. To show how these German magnetos were regarded, it is known that the military authorities in Paris stripped all motor cars of their German magnetos and placed them on military aeroplanes. The car owners had to be content with the best French or American makes after that.

American magneto makers immediately went to work to experiment and make magnetos that would equal the German, and within the last few weeks they have succeeded. Several concerns have succeeded in developing magnetos that

are as good as any that ever came out of Germany. Other companies are working along the same lines, and the motor makers of this country are at last entirely independent of Germany in every way.

## House Leader Kitchin Is Scored for His Narrow Perspective on National Defense

**T**HE argument against the plans of national defense made by the Hon. Claude Kitchin of North Carolina cannot be taken seriously. Obviously, he knows next to nothing about the navies of foreign powers and is merely talking at random. It is evident that he has a poor opinion of navies, but he does not convince us that his opinion in this matter is of large public importance.

Mr. Kitchin has made many statements which are not founded on fact, and Mr. Woodhouse, in the letter which follows, offers refutation which it will be hard for the Honorable Gentleman to overcome:

*The Honorable Claude Kitchin, Representative in Congress, Kingston, N. C.:*

MY DEAR SIR—In your public statement you declare that "all talk and writing about our utter helplessness, our dangerous unpreparedness, our defenseless condition, is pure tommyrot."

Being the author of many articles on the subject of national defense, and having gone further and subscribed \$500 and given much of my time to the National Aeroplane Fund, I am concerned. But before I consider your statements or the deduction which you have made, that the United States Navy is superior to the German Navy, from information which you state you obtained from a "year book," I should like to have you answer these questions, which are part of an article of mine appearing in the Metropolitan Magazine for January, 1916:

If the United States Navy, which has less than twenty aeroplanes in commission and ordered, and only a small training dirigible ordered, is considered by you to be superior to the German Navy—which has over 2,000 aeroplanes and not less than forty huge Zeppelins—what is the answer?

If the submarine is the most dangerous enemy of the dreadnaught and commerce, and the aeroplane is the most effective enemy of the submarine, does it not follow that without aeroplanes our dreadnaughts, which cost hundreds of millions of dollars, and our commerce, which is the very blood of our economic whole, are criminally unprotected?

If an up-to-date aeroplane, at most \$25,000 can, by going at a speed three times greater than the speed of a cruiser, displace three cruisers in coast patrol and submarine hunting, doing with \$25,000 and two men what is now done with \$6,000,000 and one thousand men, is there excuse for not having such aeroplanes?

If one aeroplane costing but \$10,000 can save an \$18,000,000 battleship from destruction by a \$7,500 torpedo, what's the answer?

If the United States Navy, which was first to adopt aeroplanes for naval service, now, after four years, has less than twenty aeroplanes and only one small dirigible available and ordered, only one aviation station, and one ship assigned to aeronautical service, but unequipped; and if the naval program recently published proposes to add only seventy-five



aeroplanes next year, when the need is for seven hundred and fifty—will we be able to say: "We have met the enemy and he is ours" when the time comes?

I assure you that those of us who are contributing our money and efforts to give aeroplanes to the militia, to make up the deficiency in the Army and Navy, wish that what you say were true—but we have first hand information to prove that it is not true. If you will give up getting your information from obsolete year books and get first hand information, as a man in your position should do, you will see that you are mistaken.

Does it not seem to you that, considering that you are one of the leaders of the House of Representatives, which is the board of managers of this great, prosperous country, and further considering the fact that you are one of those who have been intrusted with the sacred task of looking after the safety of the country, the welfare of a hundred million people, and the protection of values estimated at nearly \$188,000,000,000, it is your duty to familiarize yourself with conditions as they exist, rather than to get misleading information from a "year book."

The General Staff of the Army and the General Board of the Navy, which is comprised of men whose abilities and integrity are unquestionable, and in whom the people of this country have absolute faith, can supply you with any information you may require to prove that we are dangerously unprepared, your statements to the contrary notwithstanding.

Regarding the cost of placing the Army, Navy and Militia in the state of efficiency necessary to afford the protection that this country should have, you state that it would involve placing a "terrible burden of taxation" and that the Treasury is "unable to withstand the increase."

I fear that the verdict of the country will be that for a man holding the important position which you hold, you have a very narrow perspective. Only peace-at-any-price advocates, who do not reason, and people of small mental perspective, who do not see, can consider as being excessive the expenditure of one billion dollars, which is the amount required to bring our defenses up to a state of sufficiency. This is a rich, prosperous country with tremendous resources. The national wealth is estimated at close to \$188,000,000,000 and the sum of one billion dollars is really not excessive to spend to insure it. It means a payment per capita of less than \$10.

Can you consider that excessive, to pay \$10 this year for national security—to protect your country, your family and your home? Of course not, you spend more than that in any one of a hundred superfluities. If you have a cat, you undoubtedly pay more than \$10 a year for cat meat, just to keep your house free from mice. Supposing that it does cost \$500,000,000 a year to support our Army, Navy and Militia after this year (a point which is worrying the peace-at-any-price disciples and people of small mental perspective), that surely is not large enough to worry about.

What has been spent in armament in this country in the past has proven to be a good investment. Even Henry Ford, who objected to further expenditures because one billion dollars' worth of military equipment had deteriorated unused, could not find that it had been a bad investment when it was pointed out that that equipment protected the country while the national wealth increased from \$7,136,000,000 in 1850 to \$187,739,000,000 in 1915.

Concluding, I must state that if you really have the welfare of the country at heart, and if you really wish to represent the people in the matter of solving this harassing problem of providing sufficient protection for this country, the best way is not to insult the millions of people who are worrying over this problem, as you have been doing. The best way is to familiarize yourself with the subject by consulting with those who are familiar with existing conditions and then consider the problem in relation to the welfare of the nation from an economic as well as a sociologic standpoint. When you have accomplished this you will be qualified to speak—and I feel quite sure that when you have done that your opinion will be the very opposite of what it is now.

Yours for the broad and efficient preparedness which the vast majority of our citizens wisely demand.

(Signed)

HENRY WOODHOUSE,

Governor of the Aero Club of America, Member of the Conference Committee on National Preparedness.

#### Adequate Preparedness

(The Boston Daily Advertiser)

ONE of the worst possible defects in any policy of preparedness must be a failure to make it adequate. It is better not to spend a cent on preparation than to waste the money by cheese-paring, so that the preparation,

when tested, only sends men against hopeless odds. It recalls the very old but much cherished story of the man who rushed down the ferry slip only to find the boat already heading out into the river. "Jump, man, jump," advised his excited friend who was safely on board. "Ye can make it in two jumps."

That is exactly the policy of halfway, insufficient preparation. Halfway prepared is not prepared at all. It is a waste of money, in the matter of national defense, because the chance to take the second "jump" is utterly gone by when the danger breaks. It is too late to make good any deficiencies, then. And all the money that has been spent goes for nothing, because it accomplishes nothing of the result intended. Unless we are going to be prepared to meet any danger that may come, why make our failure any more costly than complete unreadiness would be? Either we must be prepared to defend the nation from any conceivable attack, or else it is wasting money to spend anything at all.

At the meeting, this week, of the Aero Club of America

On motion of Mr. Robert J. Collier, it was resolved that the Aero Club of America indorse the demand made upon the Administration by the Defense Movement to provide for restoring America to the second position among the nations of the world. "Every consideration of its security," he said, "demands that this shall be done at once, and the people will be satisfied with nothing less. The naval programme submitted by Secretary Daniels provides for only a small annual increase for five years, an increase insufficient to fill even the most immediate needs, and which is far from being a step toward restoring America to the position of a second naval power."

In the same connection it was pointed out that the provision for aeronautics in the army and navy estimates for next year "are only one-quarter of what they should be" in order to enable the United States to establish aviation stations in different parts of this country, and in our national dependencies.

No system of national defense is stronger than its weakest necessary link. If we cannot coal our battleships at sea, they are worth nothing for sea service, no matter how much they cost, how heavy their armor, how powerful their guns. The experience of the great armies of Europe has shown that the old methods of scouting, in these days of long range projectiles, are utterly useless. The only possible scouts are the air scouts. An army without air scouts is blind as a bat, utterly at the mercy of any strong foe equipped with proper scouting facilities. It would be exactly like a blind and deaf man fighting an equally powerful but unblinded opponent. The blind man can throw out his arms and beat the air. But that is all he can beat.

If what the Aero Club says so positively is true, Secretary Daniels may get some fun, personally, out of spending the nation's money in getting out "a fighting machine," but he will get a machine that cannot fight; one that simply must stand up and go through the motions of fighting, while the enemy is taking pot shots at the best architecture of our coast cities. Of course the aviation arm of a modern army or navy is not simply a scouting force. As this arm of the service is being developed more and more in the war across the ocean, it is coming to be one of the most dreaded and dangerous factors in the fighting. So much is it feared that no big gun is mounted exposed to observation from above. Painted tents or screens of boughs are always put above the battery, with the idea of screening the guns or crews from the sight of the bomb droppers who are constantly darting high overhead.

It was at the meeting of the Aero Club that Henry Woodhouse, who certainly might be expected to speak with some authority, said frankly that the army and navy together have barely one per cent. of the aviation equipment which they should have, if there was to be any real preparation to make this country safe against invasion. Unless Secretary Daniels can deny this flatfooted charge, his future utterances on preparedness should be printed in the humorous columns hereafter.

The men who make these criticisms are all experts in their profession. They are in close touch with every move in the great European war. They are speaking of a matter which is their life work. They say that, as things are going, we shall be absolutely unprepared to defend ourselves adequately in time of national danger. And it is beyond denial that any defense that is not adequate, no matter how many hundreds of millions may be spent on it, will be worse than no preparation at all, because it will be such a tremendous waste of money. So long as we are spending the money, why should not the nation get the worth of it?



# THE NEWS OF THE WEEK

## First Squadron Flight Under Fighting Conditions

As this issue of AERIAL AGE goes to press preparations were being completed at Fort Sill, Okla., for a flight of the First Aero Squadron of the United States Army from the temporary aviation station at that post to a permanent aviation station at San Antonio, Texas, 450 miles distant. Six army aeroplanes, each operated by an army officer, were in readiness to make the flight under conditions approximating the use of aeroplanes in warfare.

The flight was designed on a scale which will test more than the men and the aeroplanes. The aviators were to be tested in their ability to follow a given course over an unknown country, but following in the wake of the aeroplanes were a number of automobile trucks which were required to make eighty miles a day and to render to the aeroplanes such services as the conditions made necessary.

To each aeroplane was assigned one truck as tender, carrying the crew, tools, spare parts and other supplies. A newly developed machine shop truck, carrying a lathe and forge, attended to maintain the squadron on the way. For minor repairs a corps of six motorcycles, carrying emergency repair kits, was depended upon.

Captain B. D. Foulis, the oldest military flyer in point of service in the army, was in command of the aero squadron. The other pilots were Lieutenant T. D. Milling, Lieutenant C. G. Chapman, Lieutenant J. E. Carberry, Lieutenant T. S. Bowden and Lieutenant I. A. Rader.

November 20 was the original date set for the flight, but the fact that the station at San Antonio is in readiness caused the authorities to change the date. Stops were made at Wichita Fall, Bowie, Decatur, Fort Worth, Cleburne, Hillsboro, Waco, Georgetown and Austin, Texas.

The invention of an automatic survey camera has occupied much of the time of the aviators at Fort Sill. This apparatus, when set in operation by the pilot, takes a continuous series of photographs of the ground underneath. The photograph gives a connected group of overlapping pictures to which a scale can be applied and from which the range to any point shown on them can be at once obtained. In addition to this survey camera a telephoto lens can be put in operation which will search out concealed troops, batteries and convoys. Similar experiments will be continued at San Antonio.

## New Altitude Record in Argentina

A newspaper dispatch from Buenos Ayres states that on Nov. 20 Lieut. Zanni, an Argentine military aviator ascended to a height of 6,500 meters, or 21,325 feet, but the dispatch is lacking in those details necessary to show whether or not the flight actually establishes a new altitude record.

Lincoln, Nebraska, as seen from one of the aeroplanes of the National Guard of that State in the recent Army maneuvers.



## Harvard Graduates Forming an Aviation Corps

Five prominent residents of Marblehead, Mass., all Harvard graduates, have under construction two large hydro-aeroplanes in which they will learn the art of aviation themselves, and teach others, not merely for sport, but alarmed at the defenseless condition of the nation, they feel that it is incumbent upon every citizen to do his share in preparing the country against war. The machines are to be of the Burgess-Dunne type. One machine will be owned and operated by Gordon Balch, Norman Cabot, Richmond Fearing and Dr. John C. Phillips. The other will be the property of Godfrey Lowell and will be operated by him and by his eldest son, James Jackson Cabot.

"My hope," says Godfrey Lowell Cabot, who is deeply interested in the movement for preparedness, "is that other men will buy machines and learn to fly, with the distinct understanding that their machines and their own services will be at the disposal of the Federal Government in case of war. Germany stands for the spread of 'kult' by any means at her disposal. I stand against that and our primary object is preparedness against that hour which will come, early or late, when we of America must defend our shores against aggression from Germany or from some other power unless we strengthen our defenses to such an extent that other nations will not dare to attack us. I hope that this undertaking to which we are devoting our efforts will prove to be the entering wedge in a movement of national proportions.

"We who are associated in this effort wish to hear from all who will join us and thus increase by 100 fold their probable military value to the country in case of war—and in averting war by manifest preparedness. We want more machines and more men selected with a view to military use."

Mr. Cabot invites correspondence or personal visits from anyone who wishes to join in this movement or to further its spread. He resides at 16 Highland street, Cambridge, and has offices in the Old South Building, 294 Washington street, Boston, Mass. He is a manufacturer of carbon black and producer of natural gas.

## San Antonio Students To Fly for Licenses

Four students of the Stinson Aviation School, at San Antonio, Texas, have made application to the Aero Club of America for opportunity to go through the necessary tests for their pilots' license. They are: John A. Harmon, John E. Walker, Herbert W. MacKenzie and Joseph Gorman, all of San Antonio. It is expected that judges will be appointed immediately by the Aero Club and that official tests will be made in the very near future.





Messrs. Acosta, Carlstrom, MacGordon and Gilpatrick with an armored car at Toronto, Canada.

#### Simplex Motor With Wright Aeroplane Co.

Announcement is made of the purchase by William B. Thompson of the Simplex Motor Car Co. of New Brunswick, N. J., as a part of the plan for the development of the Wright Aeroplane Company. The Simplex has been found to be adaptable to aeronautic purposes and it will be further developed along that line.

A working agreement is being perfected also between the Wright Co. and the Submarine Boat Corporation for the construction and testing of aeroplanes at the boat plants in Bayonne, N. J. The latter are so equipped that there is a decided advantage in such an agreement. The location, too, offers opportunities for testing on the Jersey meadows in the near vicinity.

The Wall Street Journal says: "There are \$40,000,000 worth of aeroplane orders in sight as soon as the company has made the necessary arrangements for handling this volume of business."

#### The Goodier Court Martial Concluded

The court martial of Lieutenant-Colonel Lewis E. Goodier, Judge Advocate of the Western Department of the Army, charged with encouraging officers at the U. S. aviation school at San Diego to bring charges against their superior officer, has been concluded at San Francisco and a verdict has been found and forwarded to Washington.

#### Aeromarine Twelve Nearly Ready

The new twelve-cylinder aero engine of the Aeromarine Plane & Motor Company, of Nutley, New Jersey, will be given a dynamometer test in the very near future. Some of the preliminary tests have been extraordinarily successful.

Mr. Harry B. Wise informs us that the first of December will find the firm making deliveries on their fourth substantial order, and that he is on the point of closing several other large orders.

We will print a full description of the "twelve" in an early issue as soon as the dynamometer tests have been made.

#### Curtiss Builds Boarding House for Employees

Ground has been broken for the Curtiss boarding house. The dimensions of the building are 32 x 100 feet, two stories high, and will accommodate fifty people. The Dudley Brothers of Bath have the contract for the building, which when completed will be fully equipped with every needed appliance for the accommodation of the Curtiss employees, and will be conducted on the profit-sharing plan.

#### Baroness Will Take Up Aviation

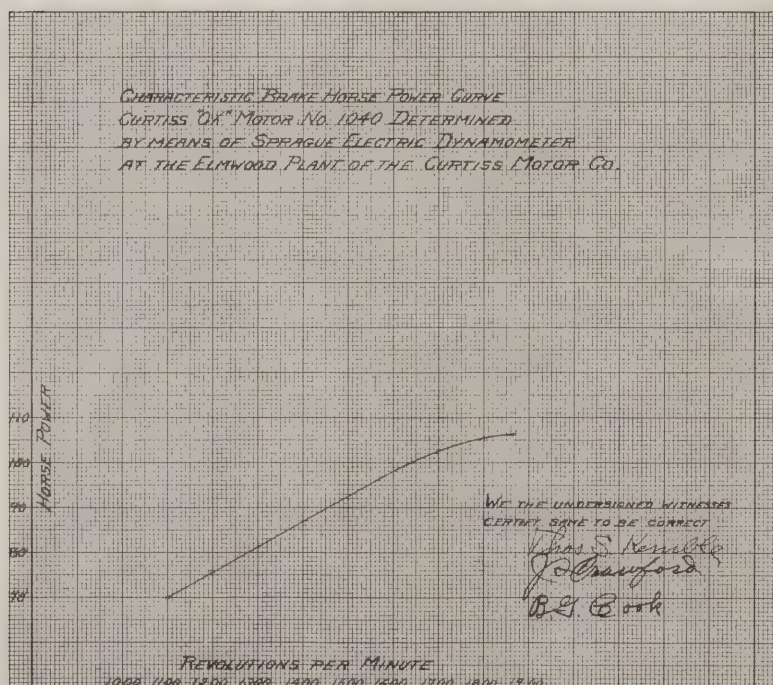
Hon. Frederick C. G. Eden has gone to Florida where he will establish an aviation school.

Among those who intend to take up aviation is Baroness de Benckendorff. She is the wife of Baron Andre de Benckendorff, nephew of the Russian Ambassador to England, and was Miss Gertrude Orr, of Kentucky, before her marriage. Her husband is now with the Russian army. Baroness de Benckendorff has flown several times in England as a passenger, but intends to learn to fly on her own account. She will begin at Long Beach, and when the school there closes for the winter will go to Florida to finish her instruction.

#### Flying Field at Okmulgee, Oklahoma

Business men of Okmulgee, Okla., hope their city will become the centre of aviation in that state. Fred M. Roberts and Charles M. Peters, practical aviators of the Roberts Aeroplane Co. have decided to make it their permanent headquarters and to establish a plant and a training school there. The climate is favorable for flying all the year and the Chamber of Commerce of the city has donated a tract of land to be used as an aviation field. The chamber has also under construction for the use of the aeroplane company a hangar which will accommodate several machines.

Mr. Roberts is making almost daily flights over the city in his biplane. Mr. Peters, the manager of the company has arranged to have several aviators locate in Okmulgee in the near future. He writes to AERIAL AGE: "We wish to extend a cordial invitation to any of the other flyers who would like to use this field and we will allow them the free use of the hangar and the field, which is half a mile long by a quarter of a mile wide, at any time, and as long as they want it."



On November 16 OX motor No. 1040 was given an eight-hour run on the dynamometer during which it developed as high as 89 h.p. at 1400 r.p.m. This test was observed by Messrs. Jenkins and Prentice, of the British Inspection Committee.



### California Naval Militia Has an Aero Corps

The Aero Corps of the Ninth Division of the California Naval Militia, Los Angeles, recently held its first field drill on Glenn L. Martin's temporary aviation field at Greening, and all of Los Angeles rejoices in the fact that this important step for preparedness has been taken.

At the last session of Congress, immediately following the announcement that aero militia corps, if established throughout the country, would receive the support of the War Department in an advisory and a financial capacity, the officers of the naval militia division of Los Angeles formed the aero corps. That was two months ago. Since then the members of the aero corps have been receiving instruction in aeronautics at the State Armory. This course consisted of lectures by Mr. Martin and instructions in assembling aero motors. Instruction has also been given to members of the corps at Mr. Martin's aeroplane factory.

The course of instruction under roofs having advanced as far as was possible the next step required practical field work, and this will be continued with the limited facilities at hand while Congress is taking the necessary steps to provide two aeroplanes and the necessary equipment for the station. On this first drill the officers were taken on short trips by Floyd Smith, instructor in the Martin school. These flights will be continued at regular intervals for the petty officers and the yeomen of the service who are to become pilots.

At the aviation field there was a representative gathering of authorities on aeronautics during the first drill. Besides Mr. Martin and his instructor, Floyd Smith, Lieut. Douglas B. Netherwood, of the First Aero Squad, stationed at San Diego, was present for the Government. He made the trip from Bakersfield to this city Saturday afternoon by aeroplane, crossing the Tehachapi Mountains en route, especially to witness the first field meeting of the Aero Militia. He is to leave within a month for the Philippine Islands with four seaplanes and eight pilots, where he is to establish a Government aero station.

A. J. Macey, aviator and inventor of an electric stabilizer, also witnessed the first maneuvers of the corps. Caleb Bragg, the wealthy auto racer, who has recently taken up aviation, and who gave the people of this city a few thrills last Thursday by flying over the business section, is also actively interested in the Naval Militia.

There are already three licensed pilots in the corps, Arthur C. Burns, Edward Musick and Edward Oliver.

"What we need now," said Lieutenant Frank Seaver, commanding officer of the Aero Militia, "is the support of the people of Los Angeles. We have already thirty-six men in the aero division and are assured of two machines from the Government. But we want to enlarge the division. What we want are eight or more machines and more recruits to the aero corps. If a young fellow enlists in the aero division and later decides that he does not like flying he may be transferred to other divisions of the Naval Militia."

"It is the best plan for coast defense yet submitted," said Mr. Martin. "I have just returned from a conference with Secretary Daniels and have found out that he is heartily in favor of the Aero Militia and is lending all his support to the success of the plan."

### The Sperry Gyroscope

In the illustration of the Sperry gyroscope used for demonstration purposes given in our issue of Nov. 8, attention is directed to the circumstance that while the aeroplane on which it is mounted for demonstration purposes is a miniature, the gyroscope itself is of standard size.

### Sloane Company Leases Plant at Plainfield

The Sloane Manufacturing Co. has leased a plant on North avenue in Plainfield, N. J., and it is announced will remove from its present quarters in Bound Brook, N. J. The change is made for the purpose of obtaining improved facilities.

### Aircraft Bombs Feature in Ordnance Report

Among the new development of the year, shown in the annual report of Rear Admiral Strass, chief of the Bureau of Ordnance of the Navy Department, is the manufacture of bombs for use by aircraft. These have given satisfactory results in tests, he states, and more will be manufactured.

The bureau has developed a one-pounder gun to be used on aeroplanes. Plans are under way for increasing the calibre of this gun.

The bureau has also designed a four-inch anti-aircraft gun. Three-inch anti-aircraft guns are being manufactured for use on all battleships.

### Thomas News

A new school land machine and a school hydroaeroplane are receiving their final touches before being placed in commission. The land machine is, with the exception of a few minor details, the same as the machines which have been used heretofore in the school. The hydro, however, represents a radical departure in the construction of school machines and promises to be one of the finest which has ever been placed at the disposal of students.

Its chief feature perhaps is its wing section, which has been constructed on the lines of the most recent development in this connection. Two sets of struts have been eliminated without reducing the factor of safety. The student and instructor will be seated slightly in advance of the leading edge with nothing to interfere with them in case of a fall into the lake. It will be fitted with dual control with the Deperdussin on one side and the Nieuport on the other.

Some recent experiments with the two naval seaplanes have suggested various improvements which are now being incorporated in them. As quickly as these changes can be completed these machines will receive their final tests at the hands of Aviator William Brock, the young Thomas flier who will put them through their paces.

Plans are now being formulated for the improvement of the Thomas hangars and landing stages on Lake Cayuga so that next summer the school will possess every facility for the rapid training of men. A large platform will be erected in front of the hangars with tracks in order that machines can be moved with a minimum amount of trouble. This step is merely one of a contemplated series of improvements which will place the school in a class superior to anything on this continent.

The D2 Military Tractor with the new 135 h.p. Thomas Motor will shortly be placed in commission and will be employed largely as a demonstration and school machine. This step has been deemed advisable in order that the students who are for the most part preparing themselves for military and naval work may receive a little advanced training and incidentally submit the new motor which has far surpassed expectations to a thoroughly practical tryout.

### Puget Sound Aerial News

By ROBERT LA TOUR.

The Northwest Aero Club has had an eventful week beginning with a fine altitude flight on Monday by Herbert Munter and ending with a slight accident to the machine on Sunday. Monday's flight was made to test the workings of the new Hall Scott motor in the rarefied air of the higher altitudes, and was a thorough success, the motor running perfectly throughout the flight.

On Thursday President Boeing and Munter made a round trip, no-stop flight to Tacoma.

Friday the club inaugurated its campaign of teaching the need of aeroplanes for defense by dropping cardboard projectiles from the club's machines bearing messages calculated to inspire the needed action for acquiring machines for the United States.

Messrs. Boeing and Munter on Friday made an aerial trip to the Washington-California football game on the University Campus, giving the spectators many added thrills.

The accident referred to occurred while returning from a flight with Mr. Hall, a member of the club, as a passenger. A gust of wind caught the machine as it was about to alight on the water causing the pontoon to nose under. The floats were damaged, but will be immediately repaired, and there will be little delay in the club's campaign of education.

Mr. Frank Barney, one of the members of the Pacific Northwest Model Aero Club, has joined the forces of the Hamilton Aero Manufacturing Company, of Vancouver, B. C.

### It is the Fashion to Fly at Corondo

Aviation has fascinated the fashionable set at Corondo Beach, California, according to the *Los Angeles Examiner*, which says that among maids and matrons it is quite the fashion to fly.

### Activity at Grinnell Plant

The Grinnell Aeroplane Co. are hard at work on their new military biplane, which it is contemplated, will be ready for its initial tests next week. The new machine will have a spread of thirty-seven feet, and will be equipped with a 100 h. p. engine built by the Grinnell Co. The biplane is designed to carry pilot and two passengers. "Billy" Robinson will be the pilot, and he gave it as his opinion the other day that he would do some very interesting work with his new machine.



## TURNING OUT AVIATORS RAPIDLY IN CANADA



**I**N May, 1915, there was established, at Toronto, Ont., on the shore of Toronto Bay, a flying-boat school for the purpose of giving the preliminary training in flying to the candidates for commissions in the Royal Naval Air Service and the Royal Flying Corps.

Two flying boats were placed in service and classes limited to ten students placed on each boat. These classes were always kept up to the maximum number of students, as the large waiting list made it imperative to keep them working to their full capacity. The demand for places in the classes became so great that in July a third boat was placed in service and another class of ten started. Up to October 1, no less than 150 students passed through the flying-boat school and the three boats had flown in excess of 30,000 minutes or 500 hours in the air, making successfully over 2,500 student flights. This wonderful record was made without any accidents or delays of any sort with the exception of some delay due to unusually severe storms in August.

As the students acquired the art of flying and landing successfully the flying boats, they were passed through to the land school at Long Branch, Canada, where their training was continued on fast Curtiss tractors. Here after a thorough, careful training by some of the greatest of the pilots on this side of the water they were permitted to take their official Royal Aero Club tests and received their certificates or "tickets," as the Englishman loves to speak of the small F. A. I. booklet which states that he has passed successfully the Aero Club tests.

Steve MacGordon and Guy Gilpatric, aviation students, not long ago added to the interest of the class at Long Branch by looping the loop. Both used the Curtiss JN 3 type ma-

chines, MacGordon with an 0-XX motor and Gilpatric with an 0-X.

The Long Branch school has been unusually successful and has occupied a unique place in the aviation field, through the fact that the training has been done entirely upon 80 to 90 mile per hour machines. This has given the students a decided advantage on going abroad to "do their bit" from the fact that most of the training of students in Great Britain is being done on comparatively slow machines. The graduates of the school who have already gone over to England are doing splendid work and are, according to reports received here, a decided acquisition to both arms of the aeronautic service of the Empire.

Canada, unquestionably, is sending a number of her finest young men for air service abroad. The success of the school is due as much to the splendid material it has been supplied with for training as to any other factor contributing to its success. All parts of the Dominion have been represented and a single class will have representatives of every province from Nova Scotia to British Columbia. With the cream of the young manhood of the Dominion to draw from almost any aviation school would have had its work crowned with a marked degree of success.

A few comparisons for the benefit of Americans are of interest. The school has already trained more Canadian fliers than either the U. S. Army or U. S. Navy, and almost half as many fliers as there are in the entire United States. Within a year from the opening of the school, judging from the progress made thus far, it will have turned out more pilots than the United States has produced in the last six years, since Glenn H. Curtiss was awarded American Aviator's Certificate No. 1.



A Class at the Toronto Curtiss School. Reading Left to Right: G. S. Burland, R.N.A.S.; J. Cameron, R.N.A.S.; G. S. Avery, Royal Flying Corps; E. S. Boynton, R. N. Air Service; V. Vernon, Pilot, C. H. Butternorth, R.N.A.S.; W. O'Hara, R.F.C.; W. B. Edmonds, R.N.A.S.; George Henson.



# AVIATION THE FORERUNNER OF WORLD PEACE

"I WILL, God willing, live to see the day when aircraft will cross the Atlantic in a day—to bring the East as close to the West as the railroad and the automobile have brought the Eastern States to those of the West," said Alan R. Hawley, President of the Aero Club of America, in discussing the progress of aviation, its future and the new needs and opportunities of the nation that have been disclosed by the events in Europe in the last fifteen months.

"In the days of the War of the Rebellion, the civil war," said Mr. Hawley, "the clubmen, ineligible, the householders and others lived in a world of security, so far as life and limb were concerned. The battlefields were miles to the south. The aeroplane—and by that I mean the seaplane and the airplane—were unknown. The dirigible balloon was never heard of—that is to say, the modern Zeppelin. We in New York—I was only a kiddie at the time—felt perfectly safe. We were miles and miles away from the zone of hostilities. That was fifty years ago. And today! Well, today under similar circumstances the resident of New York would be in a position hardly less hazardous than the man on the firing line.

"It is a crying shame that the United States, the wonderful geniuses of which were first in the field in the practical development of the aeroplane, is today last in the aeronautical march of the civilized nations of the world. This country was the birthplace of flight. It was the United States which gave to the world the first hydro-aeroplane—or, as we now term them, seaplanes—and the first flying boat. And today it is last in aeronautics—behind all the first and second class Powers and their colonies.

"Japan, China, Switzerland, Australia and Morocco are ahead of us."

"How many aeroplanes are there in the service?" was asked.

"There are now only twenty," said Mr. Hawley, "and not all of these are fit for use. More needed? Of course. Many more. The aeroplane does more to protect lives and preserve order than any part of the service. Of the 250 registered aviators in this country today about one hundred are in actual training.

"Our navy, which boasted three years ago of being the first navy in the world to have an aviation section, has at this time but five aeroplanes in commission and five more ordered. The half dozen aviators in the navy who hold aviators' certificates have had no opportunity to gain experience in reconnoitering, have never maneuvered with a fleet and do not know what ships and submarines look like from the air.

"The United States army has a few more aeroplanes than the navy—about half a dozen. But it also has very limited resources. The very aerodrome used as an aviation center at San Diego is private property, and the aviation corps of the army appreciate the courtesy of Mr. Spreckels in donating his property for their use, but it would be unreasonable and unfair to Mr. Spreckels to expect to impose upon him always.

"The army aviators have never had practice in operating with troops; our artillery has no aerial observers; has never practiced firing with aviators as 'spotters'; the bulk of officers and the rank and file have never had an opportunity of familiarizing themselves with the aeroplane. Neither the Atlantic nor Pacific coast defence has aeroplanes; their big guns have no aerial eyes. The Philippine Islands, the Hawaiian Islands and the Panama Canal have no aerial protection.

"The national guard and naval militia have had no experience with aeroplanes, and the officers and men have never had an opportunity to become acquainted with its possibilities as a scout and range finder for big guns.

"In this latter respect, however, we are improving. The Aero Club, through the national aeroplane fund, is aiding in the establishment of aeronautics in various states.

"Since the aeronautical needs of this country have been brought to the attention of Congress by the unprecedented achievements of aircraft in the war, the necessary appropriations for building aeronautical organizations for the army, navy and militia will undoubtedly be provided.

"As everything in the line of equipment will have to be supplied, an appropriation of \$7,500,000 for the navy, \$5,000,000 for the army and \$5,000,000 for the militia will be needed. These sums may seem large, but they are not, considering that a large part represents the initial cost of establishing these aeronautical organizations—the cost of giving aeronautics a start."

"Do you consider the aeroplane as an instrument of peace or war?"

"The great mission of the aeroplane is for peace. The present great demand for aircraft for warfare will itself be instrumental in developing efficient schemes for peace purposes—for transportation, especially.

"Aerial transportation will be with us in a very short time. The military authorities' increasingly severe requirements for military aircraft have caused an incredibly swift progress, and has resulted in the development of efficient aircraft that can compete with the best means of transportation in speed, even where transportation is swiftest, and can compete economically in places where transportation is slow.

"If aeronautics have grown from an experiment to such wonderful proportions in less than ten years, a progress unparalleled even in the history of the automobile, may we not expect to see 100,000 aircraft in use within five years, one million in ten years and as many as there are automobiles today in twenty years?"

"We may even see the Atlantic nothing more than a fair sized lake in the near future?" was asked.

"Absolutely," said Mr. Hawley, "I will, God willing, live to see the day when aircraft will cross the Atlantic in a day—to bring the East of the civilized world as close to the West as the railroad and the automobile have brought the Eastern States to those of the West."

"When these things come to pass there will be a most peaceful social revolution. Swift transportation and the elimination of frontiers will rapidly mix people and their interests, and from that will evolve international civilization, and the world will become a world nation. Fast transportation and better intercommunication have been the two most important factors in the progress of civilization. They have been the arteries and veins of civilized life.

"The civil war could not take place today because fast transportation and intercommunication have brought all the states into such close relation that conditions not desirable by the country as a whole would be eliminated by public opinion.

"At the time of the civil war the states were practically disconnected and it required weeks to make known to each other what the other was doing. From that standpoint the United States was larger than the world is today. Fast transportation and intercommunication have made it shrink, as it were, to the size of a city."

"From a commercial standpoint, what are the possibilities of the aeroplane?"

"Almost infinite," was the positive answer of Mr. Hawley. "To those in touch with the broad development of aeronautics there are a score of lines of development of commercial and utilitarian nature that justify the assertion that a movement can be started to make this country the first in aeronautics."



ALAN R. HAWLEY,  
President of the Aero Club of America.

"A navy without aerial eyes is as helpless as a submarine without a periscope. An army without aerial scouts or aerial auxiliaries can be corralled like a flock of sheep. A harbor or naval base without aerial defense is at the mercy of the submarine or cruiser, and a nation without aerial forces is as helpless as a blind man."—Alan R. Hawley.



## BALL BEARING TESTS INVOLVE ACCURATE APPARATUS

Methods at S. K. F. Ball Bearing Factory Include Inspection of Material and Finished Balls With Latest Apparatus\*

By ARTHUR V. FARR

**I**N the new laboratory, which has recently been completed in connection with the factory in Gothenburg, Sweden, of the S.K.F. Ball Bearing Co., a series of tests are installed for its ball bearings, which are an example of up-to-dateness in the care and precision of bearing finish, and inspection. In no industry which involves the use of modern steels is it necessary to be more careful with the material. Fineness of structure is a necessity, and for this reason the steel is refined from the best Swedish ores in small charcoal furnaces and then melted in small crucibles with the alloying substances added to form the special S.K.F. steel.

### Three Important Properties

After all the care has been taken in the selection of the initial materials and in the manufacturing processes, there are three important properties which a ball bearing must have. They are first, high fatigue

\*Reprinted by Courtesy, The Automobile.

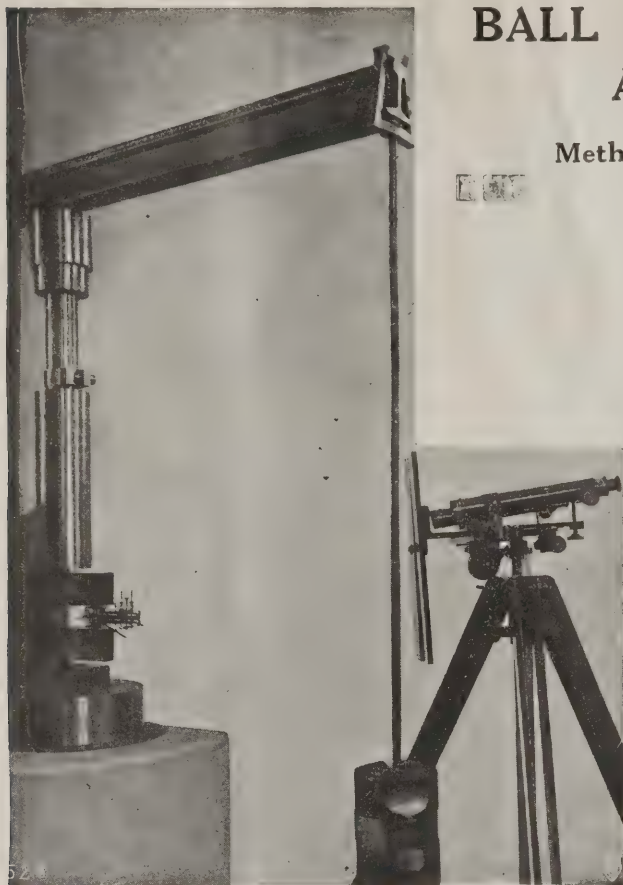


Fig. 1—Determining the elastic limit in the S. K. F. laboratory by Professor Stribeck's bending test.

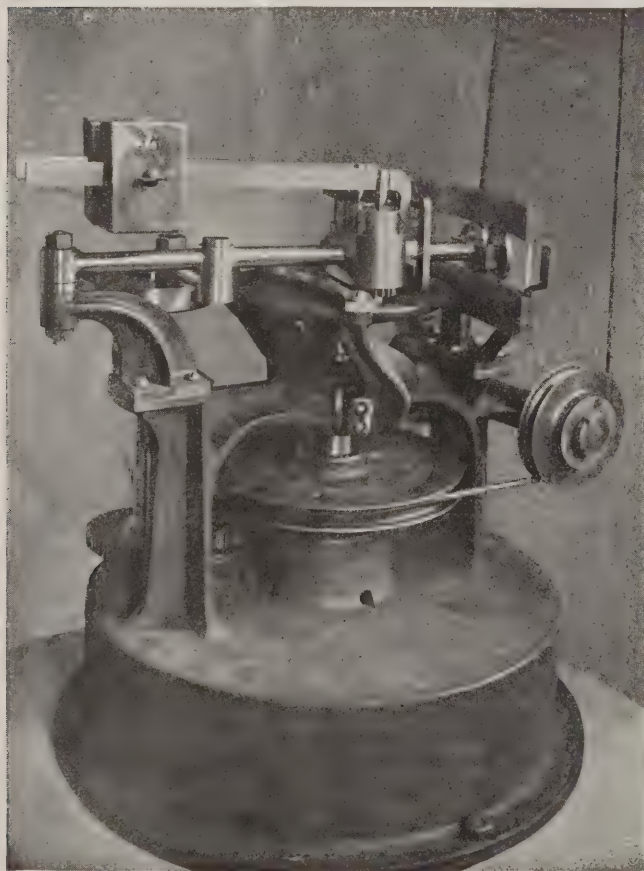


Fig. 2—Machine used in S. K. F. laboratory for wear tests by direct grinding.

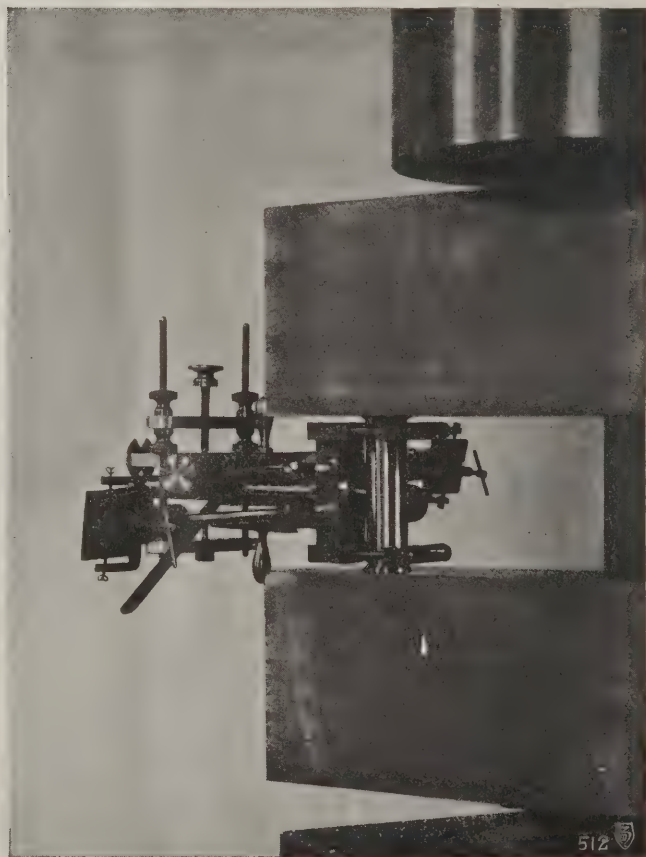


Fig. 3—For determining the elastic limit and modulus of elasticity, the above arrangement is used.



limit; second, high resistance to blows and shocks, and third, highest resistance to wear. In other words, high tensile and compressive strengths and hardness with great elastic limit are the requirements.

### Two Tests Are Necessary

There are two ways in which tests for these qualities can be carried out, and both are necessary. First, by test pieces which have been treated exactly the same as the finished product, and second, tests on the actual finished balls. In the S.K.F. laboratory for the heat treatment of the test pieces there is an electric Heracus 300 to 1,300 deg. C. adjustable furnace, and an American gas furnace for temperatures up to 1,100 deg. C., which is a muffle design with the muffle inclosed by a fire-clay chamber approximately of the same shape as the muffle. The burners project into the combustion chamber from opposite sides and force the flame into the space surrounding the muffle. There is also an oil bath heated by gas for lower temperatures up to 300 deg. C. In these furnaces the measuring of the temperatures is accomplished by a Le Chatelier pyrometer, which operates upon the principle of measurement of a current of electricity produced by heating a couple of two wires composed one of platinum, and the other platinum with 10 per cent. rhodium. The current is measured by a galvanometer.

### The Bending Tests

After the proper heat treatment has been accorded with the apparatus described, the work of determining the elastic limit and the breaking load, or fatigue limit, is done by making bending tests. The method consists of inserting a test piece in two parallel jaws which are loaded and operated as shown in Figs. 1, 3 and 8. In determining the elastic limit and the modulus of elasticity, the deflection for each successive load is carefully determined, as in Fig. 3, by transmitting the deflections to a steel pin, which is pressed against the middle of the test bar by a spiral spring. The movements of the pin are measured by the aid of a Marten's mirror apparatus. The test is so carried out that as soon as a permanent set has taken place, the load has been noted.

*(To be concluded.)*

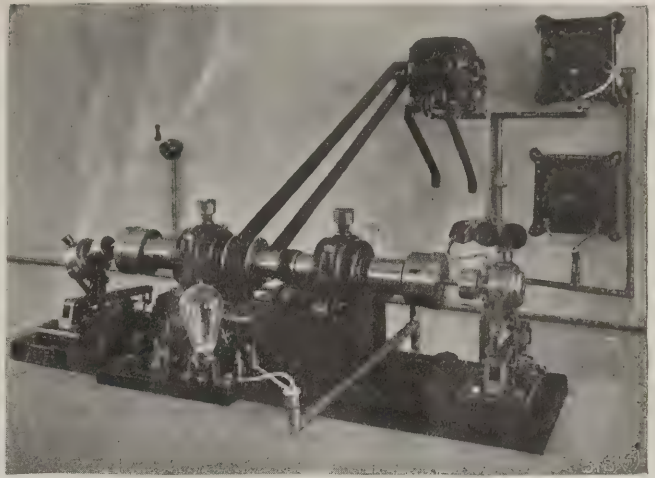


Fig. 4—The Woehler machine for testing the limit of fatigue by direct fatigue tests.



Fig. 6—Reboundimeter or scleroscope used for testing for hardness.

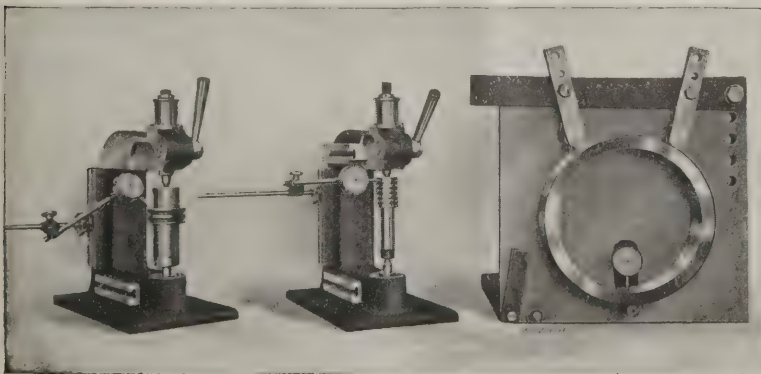
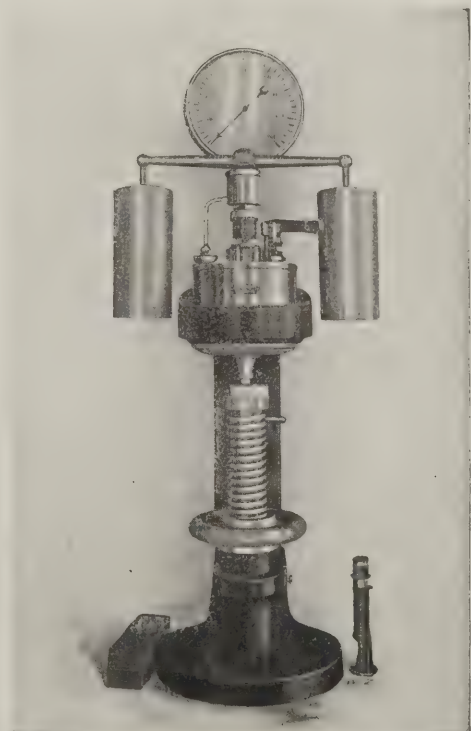


Fig. 5—Testing the finished balls for accuracy in a special appliance.  
Fig. 7—Center of right column—The Alpha machine. This machine is used in Brinnell's ball pressure test for hardness.







# FOREIGN NEWS



## AUSTRIA

In the Italian theatre of war, one of Austria's aeroplane squadrons on November 15 dropped some bombs on Brescia. The airmen observed big fires which resulted from the bombs. All aeroplanes returned safely.

## GREAT BRITAIN

A member of the Canadian contingent reports this incident in a letter to Ottawa: "On the morning of October 26 a hostile aeroplane of the albatross type was attacked by a British airman and brought to earth about two hundred yards behind our trenches in the area of our Fourteenth Montreal Battalion. The pilot was killed. The observer, who was slightly wounded, was taken prisoner."

The aeroplane was armed with a machine gun and examination proved this gun to be the property of our Fourteenth battalion during the Ypress battle in April.

"One of our airmen," says an official bulletin from Field Marshall French, "engaged a German aeroplane at close quarters, and forced it to land heavily in a field behind the German lines. Our airman, driving to within five hundred feet of the ground, opened a heavy fire on the pilot and observer who had left the aeroplane and were making across country. He also dropped an incendiary bomb on the German aeroplane which, when last seen, was enveloped in smoke."

"Our machine, damaged by the enemy's fire, was forced to land five hundred yards behind our trenches, where it was heavily shelled by the enemy, but not again struck. The pilot replaced his tank during the night, and succeeded in bringing his machine safely home at dawn."

While John Redmond, who is visiting Irish regiments at the front, was addressing the Royal Munster Fusiliers a Taube flew over his head, and as the anti-aircraft guns failed to bring down the invader the address was hurriedly brought to a close.

Robert Loraine, the actor-aviator of Great Britain's Royal Flying Corps has been awarded the cross for attacking and bringing down a German aeroplane.

## FRANCE.

Eight German aviators recently endeavored to fly over Luneville. French airmen went up in pursuit, and five of the Germans were deflected from their objective. The remaining three threw down a number of bombs on the town. These missiles wounded three persons. The material damage inflicted was unimportant.

## GERMANY.

A German aeroplane squadron made an attack on November 18 on the British camp west of Toperinghe, in Belgium, six miles from Ypres.

A dispatch from Copenhagen says the Zeppelin Z-18, which was destroyed by an explosion at Tondern, Prussia, had made only a single trip westward over the island of Sylt. The shed which housed it had just been completed at the time of the disaster. A few alterations were being made, of which the chief change was the removal of the anti-aircraft gun platforms from the roof to the ground, at the corners of the shed, in accordance with the new policy of defense.

A number of marines were assisting the workmen, and, notwithstanding strict orders, several of them smoked cigars. It is reported one man dropped a lighted cigar on the gas filled balloon, resulting in an immediate explosion. Eleven were killed or wounded.

## ITALY

It is officially announced at Rome that two Austrian aeroplanes bombarded Brescia at 8 o'clock on the morning of Nov. 15, killing seven persons and wounding ten.

All the persons killed are reported to have been civilians and some of them were women. Although there are several arms factories in the city none of them was hit by the bombs dropped from the aeroplanes.

Brescia is about as far west of the southern part of the Lago di Garda as Verona, which was attacked by Austrian aeroplanes on the previous Sunday, is east of it—that is fifteen miles.

Travellers arriving at Paris from Verona, where an Austrian air raid resulted in the death of thirty persons and the injury of more than double that number, describe the raid in interviews in the *Corriere della Sera* as having been favored by a foggy morning, which allowed the hostile air craft to approach close to the city before they were noticed. They flew as low as 4,500 feet, and each threw from five to six bombs according to the travellers' accounts, flying off when they were attacked by Italian aeroplanes.

A bomb dropped in the Piazza Erbe found women as its victims for the most part, a group of them having taken shelter under the porticos of the Chamber of Commerce. This bomb is said also to have killed a second lieutenant of infantry, the only member of the military forces who lost his life, it is asserted. One of the best known physicians in a leading hospital of the city was killed by another bomb. No damage was done to military buildings or to railway property.

On the afternoon of November 18 an Austrian seaplane squadron dropped bombs on the forts at San Nicola and Alberoni, and on the arsenal, aviation station, gas works, railway station and several barracks at Venice. Notwithstanding the heavy fire of anti-aircraft guns and the attack of three hostile aeroplanes, the Austrian squadron returned with complete safety.

Austrian aviators threw fifteen bombs on Udine, Italy, on November 19, killing twelve people and wounding twenty-seven, according to an official announcement made by the Italian War Office.

## JAPAN.

Four military aviators—Lieutenants Iba, Kawakami, Nagasawa and Takeda—recently made a cross country flight from Tokorozawa to Hirotsaki, 440 miles. The flight was interrupted by a storm and one of the Maurice Farman biplanes used was obliged to make a landing at one point on account of engine trouble, but the journey was otherwise without unforeseen incident. The aviators were received with honor wherever they landed. The route took them over the Nasu volcano.

Takayuki Takasau, who learned aviation in the United States, has tested out his new biplane with satisfactory results.

I. Nakazawa, the aviator, has arrived at Yokohama from San Francisco.

Baron Shigeno, a Japanese airman who is serving with the French corps, has been wounded and spent some time in the Japanese Red Cross Hospital in Paris.

Lieutenant Osaki had engine trouble while flying off Idzu, and was obliged to land in the ocean. Both aviator and the hydroplane were safely brought to shore.

Aerial forces played an active part in the great army manoeuvres held at Namioka. Many machines were used, reconnoitering and throwing bombs. In landing one of the aeroplanes struck a branch of a tree and broke the propeller, killing a girl and wounding a woman.

## TURKEY

On the Viak front in the Caucasus Turkish gunners brought down and captured undamaged a hostile aeroplane.

## SPAIN.

An aviation school has been opened at Getafe, Spain, about five miles from Madrid, and the Spanish Government will assist those who are receiving instructions therein. The number of students will be limited to twelve and they will be obliged to pay only a nominal fee of about \$100.



A Japanese military tractor equipped with a Gyro motor which took part in the recent maneuvers mentioned in this issue.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1363 Townsend Avenue, Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 130, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**SPRINGFIELD MODEL AERO CLUB**  
Springfield, Mass.  
**MILWAUKEE MODEL AERO CLUB**  
402 Bradford Avenue, Milwaukee, Wis.  
**CONCORD MODEL AERO CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**PLATTSBURG MODEL AERO CLUB**  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### Illinois Model Aero Club

By WARD PEASE

Practically the whole club was at Ashbourne Flying Field Sunday, the 14th, to see our president, Laird, fly for his license. The weather was particularly bad, with a strong wind blowing and the temperature around freezing. The wind did not bother him in the least and he started out very nicely but after two figure-eights the carburetor got so cold that the motor started missing and he was compelled to come down. But in the two short flights that he made, he showed in flying in the wind that was blowing. After Mr. Laird fills a date in Mt. Vernon, Ohio, Nov. 17, he will be back and try again for his pilot's license before he ships East.

Saturday night, the 20th, Mr. Wm. B. Stout will address the club on "Aviation's New Possibilities." Mr. Stout is the founder of the Illinois Model Aero Club and was the editor-in-chief of the former AERIAL AGE monthly and is well qualified to speak on this subject.

### The Buffalo Model Aero Club

By CHRISTIAN WEYLAND

Some time ago a motion was made that the club build a large glider. The matter was "put upon the table" to be taken up at a future time. At the meeting of November 16th, discussions on the question were resumed, and after being decided by vote for the affirmative, the work is progressing. The glider will be used at the club's flying grounds at Englewood Ave.

At the same meeting it was decided to study the mechanics of aerodynamics together with the construction details of large machines. During the winter months, only one meeting per month will be held, and that on the first Monday of the month until next April. Parties interested, write the Secretary, No. 48 Dodge St.

### Aero Science Club

The Aero Science Club held a meeting of particular interest on November 20, when Mr. Tismer, of the Aeronautical Society, gave a very interesting lecture on "Ringless Pistons." Having had broad experience with gas engines in which ringless pistons were used the lecture was of practical and suggestive value.



H. P. Pearson, of Denver, Colo. Many good flights are credited to this model.

### To Ascertain the Altitude of a Kite

Among the many schemes adopted by the educational system of Cincinnati to arouse the latent ambitions of pupils who, while not physically or mentally below normal, need something to wake them up, was a great kite-flying contest. The participants were required to make their own kites. Prizes were offered for several points of excellence. One prize was for altitude, but to determine the winner in this the judges were for a time perplexed because the length of the string used was not a safe indication of the altitude. It was found that a kite might use up thousands of feet of string and still not rise to the same height as a kite with a shorter line. But Prof. D. K. Heitt, with little delay, invented an altitude finder which solved the problem for both judges and contestants. The finder is a plain board, on which a quarter circle is laid out and divided into degrees. At the center of this quadrant is pinned a loose arm, carrying a set of globe sights and a pointer. A common carpenter level is attached to the side of the instrument.

When in use now this instrument is held level and a sight on the kite is taken, the angle being read at the pointer. The string is then pulled in and wound around a set of stakes, four in all, placed in the ground fifty feet apart, thus giving its length, of course.

The altitude is then found by multiplying the string length by the sine of the angle.

For example, a kite is flying at an angle of sixteen degrees and carries 2,400 feet of string. Then:  $\text{Line } 16 \text{ degrees} = 0.2756$ . Length of string, 2,400. Result, 661.4400 feet.

### Rubber for Model Aeroplanes

An English authority sets a standard by which to purchase rubber for aeroplane models. Refuse any and all rubber, he says, which when bought will not stretch to at least eight times its own length without fracture. In other words, he contends that a piece of rubber three inches long should be able to withstand the strain of stretching to 24 inches. He claims to have attained that result with a piece of rubber which he had kept in tin for nearly a year.

Some model makers find that rubber apparently new does not last more than a week, and that all strands frequently break simultaneously and in the middle, precluding the suspicion that the break has been caused by the hooks. Such failure of rubber can only be attributed to inherent weakness, and the conclusion is unavoidable that it was not new stock.

### Denver Model News

By R. H. PEARSON.

The following are specifications of the model Dunne Biplane, which the writer has successfully flown.

Motor stick is of T cross section, 45 inches long; upper wing is 45 inches across, overhanging the lower 5 inches at each end. The machine is driven by two 12-inch propellers, turned by 14 strands of one-eighth-inch flat rubber, taking about 425 turns. A triangular surface is placed at the rear to add to longitudinal stability. The wings are covered with bamboo fiber paper doped with diluted D. A. white shellac. The landing gear consists of two cork wheels and a bamboo skid at the rear. When a small vertical rudder is placed at the rear of the machine, it heads into the wind; when the surface is placed at the front of the motor stick, it flies with the wind.

The machine is remarkably steady in flight, climbing to about 40 feet altitude, and flying approximately 750 feet. Its direction is very easy to control and invariably comes down at a nice gliding angle with the rubbers totally unwound. This is something that I have never seen in my previous models.





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Countering the Zeppelin

School Porter—I found the "Not to be used except in the case of fire" placard those third-form boys stole out of the corridor, sir.

House Master—Where?

School Porter—They had nailed it over the coal-bin, sir.

#### Lucky Wasn't an Aeroplane!

One evening recently an Irishman in London stood looking over Hyde Park with intense admiration, when without any notice a small fly buzzed into his eye, bringing tears and prayers in plenty. He blinked, and winked, and rubbed his eye. "Wisha, bad scan to ye," said he. "Wasn't the whole of Hyde Park big enough for you to fly in?"

#### Raid Memos

A correspondent sends us the following, which was overheard outside a public house during the Zeppelin raid last week:

Elderly Woman—Oh, Bill, I shall 'ave to 'ave a drop o' brandy."

Bill—All right, old girl; but yer'll 'ave to pay for it yerself—I mustn't treat yer."

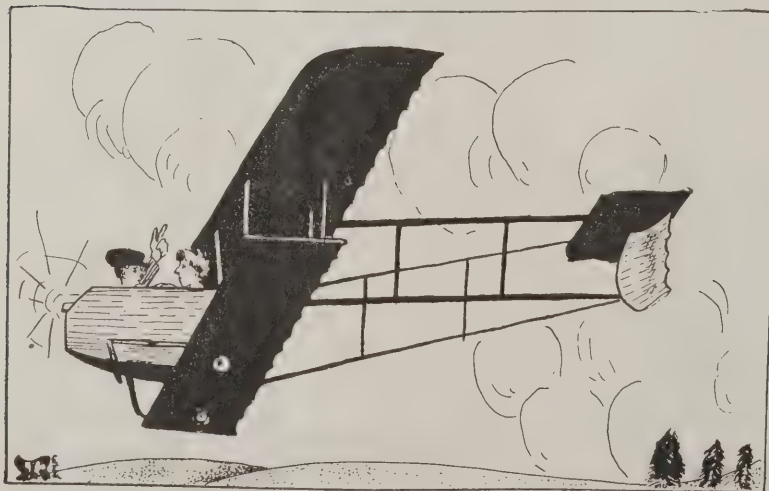
The correspondent adds that this story is "absolutely true."

Did Jones lose control of his aeroplane?  
Completely; the chef uses it all the time.

#### Sonnet

To thee, Old Zep, I shake my fist and shout;  
I cannot say your antics give me joy,  
Or that the form of joshing you employ  
Scores any hit with me. When you're about  
I kinda wish I was a submarine,  
Or yet a prowler on the Milky Way;  
It's hard to figure out just where to stay,  
To 'scape a ton of metal on the bean.  
And then, your bombs make such a beastly noise;  
Why don't you spill some soundless ones, instead?  
The present racket keeps me from my bed,  
And threatens to destroy my perfect poise.  
Go back—and tell the "Aged Count" that I  
Would like to have him stick to his own sky!

GORDON BRUCE.



"Oh, Claude, I'm nearly frightened to death up here!"  
"Be calm, Irma, there's no ground for your fears."

#### Battle Hymn of the Airmen

Up, and upward, soaring, soaring.

Lift our battle to the skies!

In this world of light the roaring

Of the temporal tumult dies.

Winged from time, we strive together;

Past the wind's last wave we run,

Climbing up the gleaming weather

Toward the radiance of the sun!

Swung afar, your guns have spoken:

Little flecks of white between

Lie like wool on blue unbroken,

O'er the earth—a mist of green.

Round and round, and sunward ever,

You, the lustrous; I, the free,

Lured to death by life's endeavor,

Soaring 'mid immensity.

Winged at length, the royal ranger

Beats his passage through the skies!

Man from danger unto danger

Fares beyond-ward, wanton-wise,

Seeks a goal through all betiding,

Fling the void his fleeting breath,

And with rapture riding, riding,

Takes the starry way to death!

Earth beneath us, planets o'er us

Wheeling, wheeling out of view;

Constellations speed in chorus

As we circle, I and you,

Lone 'mid grand Creation's story:

Through the vastness not a cry.

Poised for battle, in the glory

We are seraphs ere we die!

O'er a world where wrong and right is

In the soul's ascent we plod,

Where the heights' untainted light is

Breathless in the gaze of God.

Here our quarrel and our questing

End—but nearer to the sun.

Sternly at the last the testing

Comes to all that men have won.

Brave men strove and died before us,

But we war in fields profound;

Far above the star that bore us.

In the vastness not a sound.

Only here your shell-bursts under

Spread and fall like fiery rain,

With the gun-smoke's silver wonder

Idle on an azure plain.

Nearer to the sun, my foemen!

I above, and you below,

Swung o'er the abyss, where no men

Venture, neither tempests blow.

Silent . . . Poising in the splendor,

Passionate with mortal breath,

Sweeps my soul, with no surrender,

Down the deep to you and death!

Ruin-kist, but gamesome ever,

Proud we meet amid the blue:

Who shall speed the world's endeavor,

Splendid foemen, I or you?

Here we crash: the great downcasting

Waits. May weal us all betide:

Buoyant with the Everlasting,

Lords of death, we ride—we ride!

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## Two Aerial Mail Routes Planned

Albert Bond Lambert, of St. Louis, Governore of the Aero Club of America, has just completed for Postmaster-General Burleson the work of mapping and planning two aeroplane mail routes, of sixty miles each.

One of these routes lines wholly in Missouri, and the other takes in a part of Missouri and a part of Illinois. The interstate route will start at Peruque, Mo., cross the Mississippi River to Golden Eagle and Brussels, Ill., detour westward to Beechville, on the Illinois shore, and thence back to Peruque. The Missouri route will cross a country without railways.

The Postmaster General's plan now awaits the convening of Congress when it will be formally presented. As will be recalled the establishment of aerial air routes is designed for the double purpose of giving efficient mail service in districts where natural barriers isolate communities that by air lines are located in close proximity of one another; and of keeping in the service of the government a body of experienced and equipped aviators ready for service without any sort of delay. In this way 200 or 300 aviators can be held in reserve, the plan being to have each of these aerial mail carriers enlisted in the Aviation Reserve Corps.

## Norman Prince To Get the Cross

Instead of being a prisoner of war back of the German lines, as had been reported, Norman Prince, an American aviator serving with the French is safe in France and has been recommended for the Croix de Guerre. The erroneous report of his capture arose from an encounter he had with a German warplane which he brought down single-handed.

He wrecked the enemy's machine with his machine gun and while forced to descend close to the lines he was well within the French zone when he alighted.

This is the second occasion on which this American has been mentioned in the orders of the day for conspicuous bravery.

## Magnalite Pistons in the Astor Cup Race

An almost phenomenal record was made by the Magnalite racing pistons, described in the last issue, at the 350-mile Astor Cup race on Oct. 9.

Every one of the American cars entered was equipped with pistons of this kind, manufactured by the Walker M. Levett Co., of New York City, and of the eight cars to finish "in the money" only one, the Delange, which was sixth, had pistons of another make.

Among the foreign cars forced to drop out because of the terrific strain, broken connecting rods was the most common cause of trouble, which seems to indicate that the weakness lay at the piston, the vital point of the reciprocating parts.

None of the American cars which dropped out did so because of trouble of this nature.

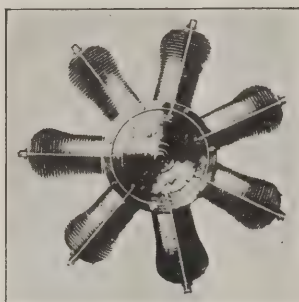
"Perhaps this showing of Magnalite pistons," writes the maker, "was the greatest mechanical triumph brought out by the race. At any rate, this assumption seems justifiable, in view of the fact also that Commodore Pugh, owner of the motor boat Disturber IV, which recently established the record of being the first motor boat to maintain a speed of better than 60 miles an hour, stated that no small part of this wonderful success was due to the Duesenberg motor and its Magnalite pistons."

G. J. Kluyskens and John Domenjoz, the Swiss aviator, who has been doing some excellent flying in the neighborhood of New York City.





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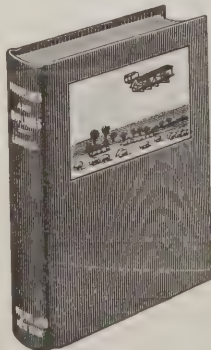
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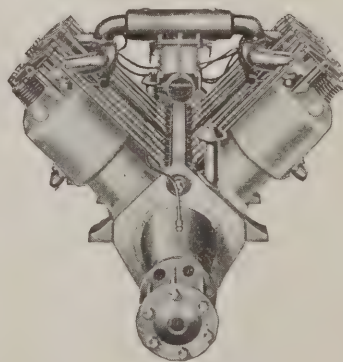
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VOL. II

NEW YORK, DECEMBER 6, 1915

No. 11

## \$25,000,000 Needed to Build Our Aeronautical Defenses

**I**N a letter to Secretary Daniels, the Governors of the Aero Club of America point out that the United States is behind the least of the other countries' colonies in aeronautics and that \$25,000,000 spent in aeronautics can only make it fifth, behind England, Germany, France and Russia. The letter, which is characterized as "a remarkable document" by authorities, follows:

Honorable Josephus Daniels,  
Secretary of the Navy,  
Washington, D. C.

My dear Mr. Daniels:

The Board of Governors of the Aero Club of America, having been authorized at the annual meeting of the club to transmit the club's endorsement of a naval policy which will restore America to the second place among naval powers; and, further, having been authorized to urge the Navy Department to provide for an increase of the appropriation to be made for aeronautics, which is but two million dollars, begs to submit herewith the following memorandum, in which, after full consideration, the Board has embodied its conclusions:

The Board heartily endorses, and joins in, the nation-wide demand now being made upon the administration that it provide for restoring America to the second place among naval powers of the world. It holds that every consideration of the country's security requires that action towards this end shall be taken at once, and is convinced that the people will be satisfied with nothing less.

The Board, however, does not presume to suggest the steps that should be taken to restore America to the position of second naval power, because the General Board of the Navy alone is qualified to say how this should be done. But the Board does believe that it is voicing the sentiment of a great body of the American people when it asserts that, whatever may be the cost of giving the United States that full assurance of safety which its restoration to the position of second naval power will provide, that cost will be cheerfully borne.

The Board believes that the Navy is now in such a state of deficiency, shortage of personnel and material that it is doubtful if the appropriation which you have recommended will do more than supply the deficiency of our existing Navy and serve to bring it up to the desired state of efficiency and homogeneity that the Navy in its present size should have.

For instance, the existing aeronautical equipment of the Navy comprises less than twenty aeroplanes, including those actually in commission and those ordered. The addition proposed would comprise only seventy-five aeroplanes, which is what we should have had two years ago, and is only one-tenth of what we need now and should at once have wherewith to meet the aeronautical needs of the Navy. Furthermore, no provision has been made for the building of a large number of dirigibles of huge size which the war in Europe teaches us we must have. These are expensive craft, requiring expensive equipment for their operation.

In studying that portion of the proposed naval program

which deals with aeronautics, the Board finds that provision is contemplated for only seventy-five aeroplanes—all of which we learn are to be installed on board cruisers. No provision is made for the auxiliary service which is essential to supply the needs of this highly specialized branch; no special hangars for carrying reserve of these fragile machines; no mother-ships, for necessarily frequent repairs and overhauling; no aeroplane-ships to accompany the fleet and to furnish planes for the important work of spotting the fall of shots, for its protection against submarine attack, for scouting search of an expected enemy-force and for the increasingly numerous and important uses to which aircraft are every day being put.

It has been for long the thought of the people of the United States that the two great oceans which wash the shores of our country are in themselves protective barriers which render us immune from attack. The extreme mobility of modern naval forces makes the sea more of a convenience for the enemy of any country with a coast line as long as ours than a barrier. An attack by land, in most cases, is restricted to a certain limited length of frontier and must come from a certain direction generally. Germany had to go through Belgium in order to reach France effectively. Our naval frontiers are of tremendous extent and an attack may come at any point. When the attack comes, it will come suddenly, almost without warning; and no man can foresee the point at which or the conditions under which the naval attacking force must be met.

The experience of the Spanish-American War (and who can forget the semi-hysteria caused by the reports of the approach of the Spanish squadron?) and of the two war-games played recently has shown that it is possible for a hostile naval force to reach our shores without detection. We have but three scouts—and no merchant-marine from which fast scouting-vessels could be drawn in time of threatened danger. From Maine to Panama, on the Atlantic; from Alaska, through Hawaii to Panama, on the Pacific, our long frontier stretches. We could not go to meet the enemy—not knowing where to come up with him. Our utter lack of scouts would impose on us an attitude and the tactics of waiting, in miserable uncertainty, at some strategically central point, until by chance we would get information of the enemy—a terrible interval of watchful waiting.

The Board has learned, in a general way, that in the event of an imminent attack the proposed method of the Government to meet the expected attack would be to deploy our limited number of cruisers along as long a line as possible and about three hundred and fifty miles from shore—holding the battleships, in groups of four, closer in shore, in the hope of being able to concentrate them in time at the point where the attack would fall. Such a division and dispersion of the main fighting force is against all accepted principles; and in the event that the main force of the enemy should, by chance or by design, run in between two groups of our battleships and prevent their junction, our entire force would be exposed to destruction in detail. These inshore groups of battleships, having no air scouts of their own, would perforce depend entirely on the outer scouting line for information, and, should the enemy succeed in getting through or around this outer line without detection (as has

**AMERICA MUST BE RESTORED TO THE POSITION OF SECOND NAVAL POWER.  
EVERY CONSIDERATION OF ITS SECURITY DEMANDS THIS SHALL BE DONE AT ONCE.  
THE PEOPLE WILL BE SATISFIED WITH NOTHING LESS.**



happened twice in war games), our dispersed main force would be powerless to stop him from reaching our shores.

The quickest, cheapest and best way in which to counteract our deficiencies in scouts is to provide a large number of seaplanes, not only with the cruisers, as is now being planned, but also with and for use by the battleships, these seaplanes to be kept on board of seaplane ships, which will go with the battleships. The Allies' battleships at the Dardanelles and the Russian battleships on the Black Sea have been supplied with seaplane service from seaplane ships.

In a plan submitted to the Board of Governors of the Aero Club of America, which is part of an article appearing in *The Metropolitan Magazine* for January, 1916, the immediate aeronautical needs of the Navy are outlined as follows:

(1) At least three more aviation stations at important naval centers in the United States, and one at each of the important naval bases in the Philippines, Guam, Hawaii, Guantanamo, the Panama Canal Zone and Porto Rico, with between twenty to forty seaplanes and aeroplanes at each base.

(2) At least two fully equipped mother-ships for seaplanes, with at least one dozen aviators and twice as many seaplanes permanently assigned to each ship. The "Mississippi" was assigned to aeronautical duty in 1913, but just as important experiments with a launching device for seaplanes were being planned the "Mississippi" was sold to Greece, and the experiments had to be postponed for a year, until this October, when the "North Carolina," which was assigned to aviation duty, finally reached Pensacola. This ship is not yet equipped for service as a seaplane ship.

(3) The Navy should acquire large seaplanes for submarine warfare and torpedo launching. Probably the most interesting thing about the conflict between the German U-boats and the seaplanes is that the "America," which was built here before the war and in which Flight-Commander Porte intended to cross the ocean, has, it is said, destroyed without assistance no fewer than three submarines. One was blown up with bombs, and the other two, we are told, were forced to come up, the "America" having broken off their periscopes by flying over them. The destroyers then got them. Seaplanes of the "America" and "super-America" class, carrying heavy armament and a large number of bombs, are much feared by the U-boats. There have been a number of cases where the aviator has swooped down on the submarine and smashed its periscope. Then the submarine, being blind, must come to the surface, where it is easy prey for either the seaplane, the destroyer or the trawler.

The Navy does not yet possess any large seaplane fitted for warfare against submarines and has only one such ordered for experimental purposes.

(4) A need which will become evident in the next six months will be for large seaplanes, to be used for launching torpedoes. All the European powers are now regretting that they did not pay attention to the development of the torpedo launching seaplane, by means of which it would be possible for every merchant ship and transport to materially protect itself against attacks not only of submarines, but also of torpedo boats and cruisers.

Torpedo launching by aeroplane is a new development, not yet practiced in the war for the reason that the powers need seaplanes in large numbers for other purposes and cannot allow their constructors and officers the time required to construct large machines and to conduct experiments in launching full-sized torpedoes.

The feasibility of launching torpedoes from seaplanes has been demonstrated by the experiments of Captain Alessandro Guidoni, Royal Italian Navy, at the arsenal at Spezia, Italy, and advocated in the United States by Rear Admiral Bradley A. Fiske, U. S. N. But the possibility of getting better results with a seaplane costing only about \$15,000 and requiring but two men to operate it, than are obtainable from a destroyer costing \$1,360,000, requiring hundreds of men to man it, has seemed too preposterous to be taken seriously, and neither of the above-mentioned officers received serious consideration until a few months ago. Captain Guidoni has succeeded in launching torpedoes weighing 700 pounds and hitting the target nine times out of ten from a distance of one and a half miles. When torpedo planes are in use, the accepted status of things in naval warfare will change.

A light cruiser, such as the German "Emden," or a small gunboat now terrorizes a whole section—nothing can reach it; the sending of a large ship is hardly worth while, when a torpedo plane, from a steamer or station, would be ample to deal with it. Again, a large merchant steamer is now at the mercy of a small gunboat or submarine. With two torpedo planes aboard, it would be quite beyond trouble—it rather could make trouble for the gunboat. Another instance: an impudent little gunboat sails to the entrance of a

port, blockades it, and prevents the flow of commerce. The torpedo planes would deal with this easily.

This report points out that Germany in her five-year budget of three years ago allowed \$35,000,000 for aeronautics, and estimates that the United States can be made fifth in aeronautical equipment by spending \$25,000,000, England, Germany, France and Russia remaining at the head; or seventh, behind Austria and Italy, by cutting the allowance down to \$17,500,000—or it can be left behind Japan, Spain and the Netherlands by allowing only \$10,000,000. Lastly, it can be left where it is, behind the least of the other countries' colonies, by allowing less than \$10,000,000.

Providing seaplanes to be "loaned" to the Naval Militia and the Naval Reserve is another important matter which has not been included in the proposed naval program. As the Navy Department has repeatedly expressed the opinion that it is necessary that the Militia be equipped with seaplanes; it is not necessary to dwell on this point further than to urge that provision be made to supply at least two seaplanes to the Naval Militia of each of the twenty-three States having such organizations. The Navy Department has promised this and several States have applied for same, but there are no aeroplanes available.

You will understand, of course, that this is addressed to you as the result of realization on our part that it is our duty to bring this important subject to your attention. We also carefully call your attention to a passage in the address of Mr. Balfour made in the House of Commons, in which, replying to the general inquiry as to why London was not being protected against Zeppelin attacks, he said that conditions would be different if England "had set to work three or four years before the war with a full knowledge of the development of aerial warfare, and if the Government of that day had set to work with that knowledge to organize the defense of London."

It is our duty to see that we in America do not invite attack by neglecting to provide adequate national defense, that it may never be said of those who are responsible for the Government of to-day, that they, like the British Government, neglected their opportunity to provide an aerial defense.

Very sincerely yours,

(Signed)

ALAN R. HAWLEY,  
President Aero Club of America.

The Board of Governors of the Aero Club of America is composed as follows:

Robert J. Collier, W. Redmond Cross, F. L. V. Hoppin, W. W. Miller, James A. Blair, Jr., Henry Woodhouse, Allan A. Ryan, Evert Jansen Wendell, Cortlandt F. Bishop, Alan R. Hawley, Henry B. Joy, Samuel H. Valentine, Henry A. Wise Wood, J. Stuart Blackton, Chas. Jerome Edwards, Cornelius Vanderbilt, William F. Whitehouse, John Hays Hammond, Jr., Albert B. Lambert, Harold F. McCormick, George M. Myers, Samuel Reber, Dr. A. F. Zahm and Rodman Wanamaker.

### Women Are for Defense

(Editorial in Buffalo Courier.)

**W**OMEN prominent in various movements for world peace have taken up the American national defense propaganda in a practical way that may surprise the peace-at-any-price element.

The Aero Club of America publishes offers made by women who appear to consider the aerial branch of our defensive forces of great importance. "The Women of 1915" has decided to raise \$10,000 for a unit of the aero-radio system of national defense, proposed by John Hays Hammond, Jr. Mary E. Burt, author and educator, has offered the club ground at Englewood Cliffs, N. J., for an aeroplane landing station.

Anita Comfort Brooks, president of the Gotham and Gridiron clubs, is to take up the subject of development of aviation corps with the Federation of Women's clubs. She has written the Aero club that "the present great war demonstrates the valuable aid of the aeroplane and submarine and the lesson should not go unheeded."

Mrs. Charles S. Whitman, wife of the Governor; Helen H. Gardiner, author and reformer; Eliza Frances Andrews, educator; Mrs. Christian Heinwick, president of the Washington branch of the Women's Peace party; Emma Beaver Byrne and Mary E. Hitchcock have gone on record as favoring establishments of adequate military, naval and aerial defense of the United States.

Contributions to the national aeroplane fund include one of \$10,000 by an anonymous woman donor that gave the New York National Guard an aeroplane and trained two officers and two mechanics, forming the nucleus of the militia aviation squad.

Lyra Brown Nickerson, of Providence, gave \$7,500 to the fund and the contribution bought an aeroplane for the militia of Rhode Island.



# THE NEWS OF THE WEEK

## Carlstrom Recommended for Aviation Medal of America

Remarkable as it was in a feat of flying the aeronautical voyage of 600 miles, which Victor Carlstrom, a young Swedish aviator, completed on Friday, November 26, is still more remarkable as a demonstration of the splendid success of efforts to replace from American resources and with American genius a foreign-made product whose importation was stopped by the war.

Mr. Carlstrom flew from Toronto to New York City (517 miles in a straight line) to try out a new 160 horsepower steel motor of the V-X type which Glenn H. Curtiss had just perfected. In this motor there is used the new American steel which takes the place of that formerly supplied by the Krupp works at Essen. After the outbreak of the war motor makers were severely handicapped by the lack of it until Americans succeeded in turning out a steel that is at least as good if not many degrees better.

Mr. Carlstrom left Toronto at 9:48 Wednesday morning, November 24, with the intention of flying direct to New York City without a stop, but he landed at Binghamton at 1:31 that afternoon, and remained over until the next afternoon. Leaving at 2:10 he flew to New York City, and crossing the heart of the metropolis landed at dark in a field near Fort Lee, N. J.

Mr. Carlstrom's voyage is best told in his own words as he described it to officers of the Aero Club of America, to which he repaired soon after landing.

"I intended to make the whole distance in one flight," he said, "and I would have done it if I had not become dizzy not long before I reached Binghamton. There was a strong, gusty wind blowing, and the machine rocked a great deal, and in addition to that I had been having some trouble with my stomach, so I had to come down. I was then about 5,000 feet up, and it is not a very healthy thing to get dizzy when you are up that far.

"When I swung toward Binghamton from Toronto I guided myself by the compass and kept my eye on the chart, until I picked up the tracks of the Lackawanna Railroad,

which I followed thereafter, and so did not have to watch my compass.

"In the same way I followed the Erie Railroad soon after I left Binghamton today and came down the Hudson. The wind was very strong, and I tried flying at about 7,000 feet for a short time, but it was much worse there, and I had to come down to 5,000. As I neared New York it was almost dark and quite hazy. I could only see one bank of the Hudson, and I wasn't any too sure of that. However, I swung over the city and went west on Forty-second Street, across the Forty-second Street ferry. On reaching the Jersey shore I thought I would find a place to land without much trouble, but I had to circle about for some minutes before I located the field where I landed. Of course I could not know that the field was pretty soft, and when I landed I made the dirt fly. I guess the machine will have to be dug out."

Mr. Carlstrom's machine is an R-2 military tractor Curtiss biplane of the type used by the Allies, built to carry a weight of 1,400 pounds. In addition to the aviator, who weighs 160 pounds, this machine carried a weight of 960 pounds. Mr. Carlstrom says that the motor's performance was entirely satisfactory during the whole trip, and that it never missed fire.

President Alan R. Hawley of the Aero Club of America was greatly pleased with the achievement. He characterized it as the best flight of the year and announced that he had recommended Carlstrom for the Aviation Medal of America, given each year for the best cross-country flight and which is soon to be awarded by the Governors of the Club for 1915 season.

## Navy Will Build a Great Dirigible

The Navy Department has decided upon the construction of a dirigible of the Zeppelin type and its construction will be begun at the navy yard in Portsmouth, N. H., on December 15. The airship will be 175 feet long, 50 feet in diameter and will cost \$30,000. The engineers who will be in charge of the work are of the opinion that it can be completed in about a month.



The Glenn L. Martin Seaplane, which, equipped with a Curtiss O. X. Motor, won the Curtiss Marine Trophy. It was piloted by Oscar A. Brindley.



### Packard Company's Practical Views of Preparedness

Henry B. Joy, president, and the directors of the Packard Motor Company, of Detroit, are engaged in making aeroplane motors not so much as a commercial enterprise, but in the firm belief that it is the duty of that corporation to develop its resources along that line so that in case this country needed it, the entire Packard plant could be placed at the disposal of the Government.

Mr. Joy, who is a Governor of the Aero Club of America, veteran of the Spanish-American war, had his attention called to the adaptability of his motors to aerial work by the importunities of agents of the Allies. There had been many requests that the company adapt its twin-six for aeronautic purposes and the company's engineers were already at work on it when the great need of adequately preparing this country became apparent. Then Mr. Joy thought of a practical way to help America in this emergency. He talked the matter over with his lieutenants, enthused them with his own spirit and the company then set about in earnest to be in a position to manufacture aerial motors. At present the development is only in its first stage. The company is turning out the first ten motors. Two aeroplanes have been purchased and are being equipped with Packard motors, of from 100 to 200 horsepower.

The company is also building a new factory which will turn out five motors a day, but if war should come, if the country should find a reason for rapid equipment, this branch of the Packard plant will be able to turn out from thirty to fifty motors a day.

"It is probably a little out of the ordinary for a corporation to go out of its way to produce such military devices as aeroplane motors, because the demand for them will probably be very uncertain," said Mr. Joy. "Yet our directors feel that it is a part of the very important duty of manufacturers in this country to mobilize their facilities into such form that they might be availed of in time of need. We are inclined to feel that our Government is going to find important need of co-operating in the development of what would be the serious wants of our country in time of military trouble, in case such an unfortunate condition should come to pass.

"We had not contemplated making any public announcement of our activities along these lines, but there is no real reason why I should not state that we are engaged in seeking to develop aeroplane motors of or in the neighborhood of 100 h.p., and of 200 h.p. for light scout aeroplanes and heavier duty military aeroplanes.

"I feel that I have understated the proposition as to the views which our directors hold of the duties of manufacturers in this country to work in co-operation with the Government officials, so that we may be ready for any contingency. Our company feels that it is its duty to carry on this work toward the condition of military preparedness, which all our directors thoroughly believe is the important necessity of the day."

The Packard motors will be used in the aeroplanes manufactured by John E. Sloane, of the Sloane Aeroplane Company, which has offices in New York City and a plant in New Jersey. This company has been working along lines

which coincide with those of the Packard. Charles H. Day, the Sloane company designer, who has built the machines which the Sloane company is making, has designed a 200 h.p. aeroplane having a speed of more than 100 miles an hour and a fuel capacity to keep it going for six or more hours. If the trials of this machine come up to the expectations of the officers of the company and others interested, the two manufacturers—the Packard and the Sloane, working in conjunction—will be in a position to supply large quantities of aeronautic equipment to the Government in case urgent necessity should arise.

### Flew to His Thanksgiving Dinner

Peter C. Millman, a young aviator from Pittsburgh on Thanksgiving Day flew from Hempstead, L. I., to Greenwich, Conn., in twenty-two minutes to keep a dinner engagement with Mr. and Mrs. A. W. Church. He used a Smith tractor military aeroplane with an 80 h.p. motor of the Gnome make. Mr. Millman also carried his mechanic, Vincent Amos. An altitude of 1,000 feet was attained. Mr. Millman's journey of about twenty miles in a straight line would, if made by rail in the usual way, have required several hours.

### Albert S. Heinrich with Aeromarine

Mr. Albert S. Heinrich, formerly of the Heinrich Aeroplane Co., is now associated with the Aeromarine Plane and Motor Co., of Nutley, N. J., as chief designer. He is at present engaged in designing two types of military tractors which will co-ordinate the suggestions which he obtained on his recent visit to Europe. It is expected that flight tests will be made early next year.

### Flight at the Cotton Palace

Aviator O. E. Williams made a flight at the Cotton Palace in Waco, Texas on Nov. 18, carrying a passenger with him.

### Correction of a Formula

To the article on "Spruce Aeroplane Struts" in our issue of August 16, 1915, by J. C. Hunsaker, the following corrections should be made:

1. Euler's formula has a constant  $n^2$  as printed. This should read  $\pi^2$ .

2. The formula for long columns printed in the text is  $P = 8.72 E$

$\frac{P}{A} = \frac{8.72 E}{\frac{L}{K^2}}$  which is correct when  $E = 1,825,000$ . In Figure

1, this formula is repeated in the legend as  $\frac{P}{A} = \frac{6.5 E}{\frac{L}{K^2}}$

which is correct if  $E = 2,200,000$ . For spruce the average value of  $E$  is not so high as this, and the formula of the text is a better guide. Due to an error in correcting proof this change was not made. The formula for long columns given on Figure 1 should be made to agree with the text and the value of  $E$  changed to 1,825,000.



A few of the Thomas Military tractors ready for shipment to Europe.



**Brindley's Flight Made with a Curtiss O X Motor**

The notable flight, which O. A. Brindley made in California in competition for the Curtiss trophy, was remarkable in many ways. In the 554 miles covered only one stop was made during the entire ten hours. There has, however, been some misunderstanding in the aeronautic world as to the motor with which the flight was made, and this is now cleared up by the following telegram from the aviator in which he declares that he used a Curtiss O X motor:

San Diego, Cal., Nov. 22, 1915.

G. H. Curtiss, Buffalo, N. Y.:

Many thanks for your congratulations. There seems to be some misunderstanding in regard to the motor I used in my flight for the Curtiss Trophy. I used O X Curtiss motor, which ran perfectly during my flight with the exception when the mechanic poured water in the gasoline tank by mistake. If it had not been for this, would have made much greater mileage.

O. A. BRINDLEY.

**Heinrich Aeroplane Co. Reorganizes**

The Heinrich Aeroplane Co. has recently been reorganized and Mr. R. K. Mickey, of the R. K. Mickey Co., has become its president. Mr. Mickey announces that it is the intention of the new organization to greatly enlarge the production facilities of the firm, and that the name of the firm will probably be changed in the near future.

**Features of the Ashmussen Motor**

The aviator, and others who witnessed the first flight of the Stephens flying boat over Narragansett Bay, estimated that it raised from the water in less than 200 feet from the standing start. It was equipped with a 105 h.p. motor of the Ashmussen make, whose points of merit as indicated by the manufacturers are well worth every consideration in view of the performance of the engine.

The Ashmussen is in two sizes—an eight-cylinder, 70 h.p. and a twelve-cylinder 105 h.p. engine. The construction is simple though substantial. All cylinders, heads, pistons, connecting rods, valves and springs are interchangeable, there being no rights or lefts. There are no oil or grease cups. All that is necessary to insure lubrication is to pour oil into the tank and the motor will take care of itself. Neither are there fans, blowers or radiators, as each cylinder has a number of air channels through which the air to the carburetor travels. This system cools the cylinders and heats the entering gas to a degree which makes the explosion more positive than if it were cold; and it is also pointed out that this feature permits the use of a very low grade of gasoline or even kerosene.

The engine can be set to turn in either direction and is equally adaptable for pusher, tractor or chain-drive machines. Nor is it necessary to remove the engine from an aeroplane to make an examination that may be desired of any part. It can be disassembled in twenty minutes for the inspection of cylinders, pistons, bearings, crankcase, heads and valves and can be reassembled in twenty-five minutes. If it is desired, self starters can be easily attached, or priming system with push button can be supplied.

**Wright Graduates Get Royal Certificates**

Five graduates of the Wright Aviation School at Dayton, O., have received certificates from the Royal Aero Club of the United Kingdom. They are as follows:

346. George H. Simpson, Oct. 2, 1915.
347. Gordon Fraser Ross, Oct. 6, 1915.
348. K. G. Macdonald, Oct. 8, 1915.
349. Percy B. Beasley, Oct. 8, 1915.
350. Stearne T. Edwards, Oct. 11, 1915.

**Pacific Coast Aviation News**

Charlie Niles upon completing his contract with the Panama-Pacific Exposition here was presented with a beautiful cup. Mr. Niles left for Japan Nov. 20th on the Chinyo Maru, with his manager, Mr. Max Friedman, and his mechanic, Frank Murray. Leon Friedman and George Guemigah, the Japanese interpreter, left for the Orient in advance of Mr. Niles. The latter will fly at Honolulu on his return trip. He took one monoplane and his Christofferson biplane.

Art Smith is flying at the Exposition, and was tendered a large reception upon his arrival here from the east. He does what he calls the Jelly Roll, an added feature to his already startling show.

Silvo Pettirossi left for South America a few days ago. It is understood, Mr. Pettirossi is interested in experimental work in aviation in South America.

Silas Christofferson will make a non-stop flight from San Francisco to San Diego in the near future with his Christofferson Aeronautical motor now undergoing tests in the plant at Oakland, Cal.

Joe Bocquel flew his biplane from the Exposition to Oakland, last Monday, making eighteen loops on the trip.

Harry Christofferson is in Los Angeles, where he established another passenger carrying station. Two biplanes were sent to him from the Christofferson Aircraft Mfg. Co., a few days ago. As soon as Mr. Christofferson makes all arrangements, Thor Poulson will take charge, and Harry will return to his passenger carrying station at Ocean Beach, San Francisco.

Allen and Malcolm Loucheed are carrying passengers at the Exposition daily, and are successful from every standpoint, as they have not experienced the slightest accident, and have taken hundreds of passengers aloft each month.

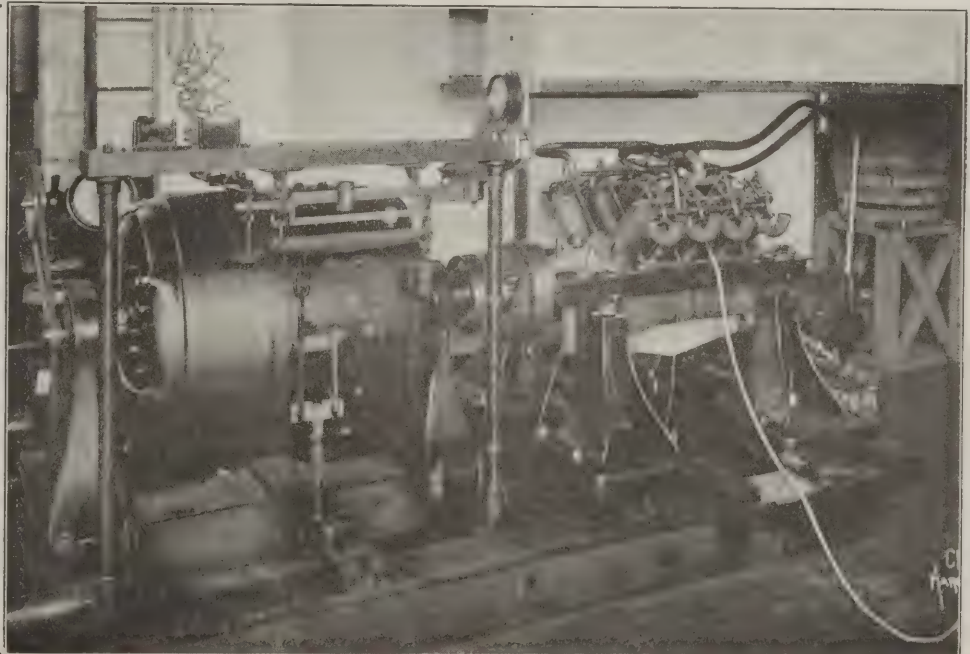
**Reduces Cylinder Weight by Half**

Mr. Silas Christofferson of Oakland, Cal., is making elaborate tests on a new type of aerial cylinder composed of steel and aluminum by which the weight of the cylinder head is reduced by one-half and a greater strength is attained than before.

**Walter E. Price To Resume Flying**

After more than a year's retirement Walter E. Price, of Sutherland, Iowa, will resume exhibition work in the spring. He has abandoned the monoplane and has completed the construction of a pusher biplane of the Curtiss style with 50 H.P. motor.

One of the electric dynamometers used by the Curtiss Motor Co. to test the power, speed and load of motors. The O X Motor is here being tested. One of these motors was given a run of 48 hours at the Hammondsport branch of the Curtiss Co. 24 hours at 1,000 r.p.m., and 24 hours at 1,400 r.p.m.





### Army Aviators at Fort Worth, Texas



**T**YPICAL of the increasing interest of the country in aeronautics and in the need of adequate preparedness was the reception tendered at Fort Worth, Texas, to the six army aviators who stopped there on their cross-country flight from Fort Sill, Okla., to San Antonio, Texas. Their greeting had deeper significance than the usual courtesy extended

to them at Wichita Falls, their first stop. The aviators buffeted yet they made this leg of the journey with ease and without discomfort and landed lightly in the field which had been assigned to them for that purpose. Mayor Tyra, on behalf of the assembled citizens, extended a formal welcome. Five of the machines landed within a minute of each other. Captain Foulois, commanding the squadron, was five minutes behind the others in coming to earth. The welcome had also been given in the international code. Flying from a flagstaff that had been raised on the grounds was a large American flag. Underneath were the mayor's flag, a Texas flag and a Panther pennant. Beneath this was the flag of the Southwest Aeronautical Association and then seven signal flags spelling out the word welcome.

The six pilots were the guests of Mayor Tyra and the Southwestern Aeronautical Association at an informal luncheon at the Metropolitan Hotel during the afternoon. In the evening they were the guests of the Fort Worth Chamber of Commerce at a banquet attended by about 100 of Fort Worth's leading citizens and the entire city commission.

Captain Foulois and his five pilots were elected to honorary membership in the Southwestern Aeronautical Association and membership cards were presented to them by President R. E. L. Costan. The strip of ground on which the squadron landed was christened Foulois Landing in honor of the commander of the squadron.

In the address which he made to the business men of Fort Worth at the banquet Captain Foulois made a profound impression in his recital of the struggles which he had gone through for the development of aviation in the army, and he

perceptibly quickened the appreciation of those who heard him in his statement of the needs for adequately preparing this nation against the possibility of a foreign invasion.

"I started to work in the flying game in 1908, when the Wrights started," stated Captain Foulois. I was relieved from the corps twice due to bills that Congress passed, although when I first entered the game I had set my heart upon making it my life's work.

"We have been struggling for seven years to gain recognition for this important branch of the service, but without support from Congress and it has been a mighty hard struggle.

"As Major Elliott has stated, it is appalling to think that 99 per cent of the aviation force of the United States army is represented here tonight with but six aviators. A total of fifty-three aeroplanes have been bought by the United States during these seven years, while there are being shipped abroad daily more aeroplanes than the United States army has used in seven years.

"I was sent to San Antonio in 1909 with the only machine the United States government then possessed. I was to teach myself to fly and was allowed \$150 per year for the upkeep of the machine, including repairs, new parts and fuel. During that year I spent \$300 out of my own pocket. That's what we have been up against for seven years. We have a total of twenty-five air pilots in the United States army today out of a standing army of 80,000 men.

"If Germany wins this war she will come out of it with the strongest army in the world. If we do not prepare not only in aviation, but in all branches of the service we are going to find ourselves in a very bad situation. If any one of those European countries wants to tell us what to do under the present state of preparedness we will have to take it.

"The reason we are not prepared is because you business men who are interested only in your civil affairs give little attention to military affairs and have not time to think of preparedness.



Left to right: Lieut. Thomas S. Bowen, Lieut. Joseph E. Carberry, who holds the American record for altitude, accompanied by passenger, Capt. B. D. Foulois, Lieut. T. DeWitt Milling, Lieut. Ira R. Rader, Lieut. Carlton G. Chapman



# THE NEW CHRISTOFFERSON ENGINE

By Neil MacCoull, Jr.

**T**HE Christofferson Aircraft Co., of Oakland, California, has just placed a new six-cylinder engine of 120 h.p. on the market. It is provided with overhead valves and camshaft, the excellent characteristics of which are well known. The cylinders, vanadium iron, are cast in pairs, each pair having a single copper water jacket. The camshaft and its housing are in three separate units, one for each pair of cylinders, and so joined that any cylinder pair may be completely removed without disturbing either of the other pairs.

Like many of the most recent aeroplane and automobile engines the pistons, crankcase and oil sump are made of an aluminum alloy. In this instance the alloy is known as "Aloyanum," and has the high ultimate strength of over 40,000 pounds per square inch. All steel parts, such as the H-section connecting rods, the wrist pins, gears, crankshaft, etc., are made of chrome nickel or chrome vanadium steel.

One of the most important features of this engine is the lubricating system. Oil at a pressure of 40 to 80 pounds per square inch is forced to crankshaft bearings and after passing through the hollow shaft to the crankpin bearings. Oil is also had from the main bearings up to ducts in the cylinder castings, which supplies the pistons and wrist pins with lubrication. All excess oil drains back to the sump where it is cooled to a considerable extent by a special oil radiator. From here it is forced to the main bearings by a gear pump located directly in the lowest part of the sump.

## The Christofferson Six-Cylinder Aeronautical Motor

**HORSEPOWER:** 120 H.P. at 1,400 revolutions per minute.

**BORE:** 4¾ inches.

**STROKE:** 6 inches.

**LUBRICATION:** Oiling system is forced feed, to run at 40 to 80 pounds pressure to the square inch.

**CRANKSHAFT:** Crankshaft is supplied with a ball bearing taking thrust in either direction. The crankshaft bearings are 2⅝ inches in diameter.

**CARBURETOR:** A double carburetor is used.

**VALVES:** Valves are 2⅜ inches in diameter.

**CONNECTING-RODS:** I-beam connecting rods are used, made of chrome vanadium steel, and having a tensile strength of 225,000 pounds to the square inch, when heat treated.

**IGNITION:** Two independent magnetos are used, also two spark-plugs in each cylinder.

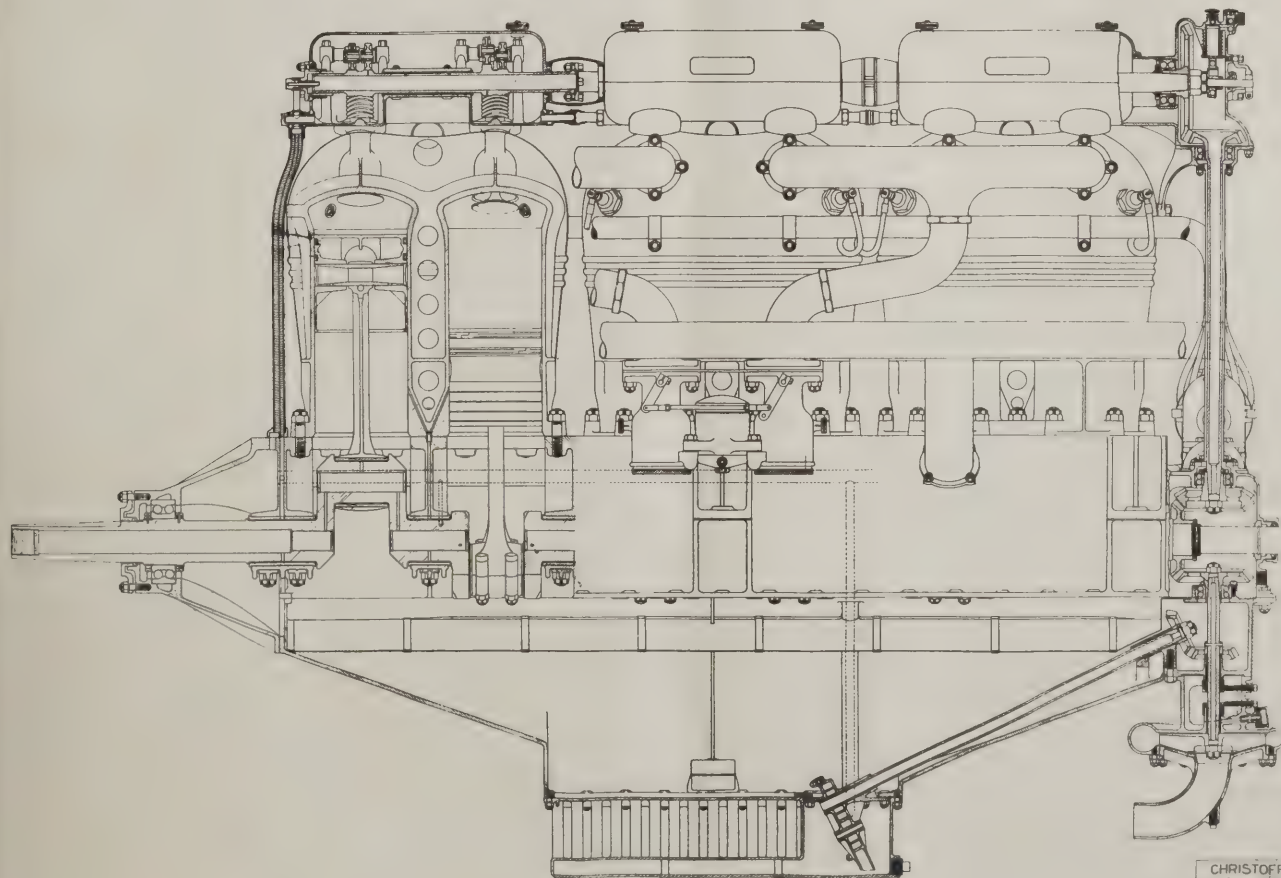
**PISTONS:** Pistons are made of Aloyanum, weighing 1¾ pounds, and having two rings.

**CYLINDERS:** Cylinders are made of vanadium iron, with a tensile strength of 40,000 pounds to the square inch.

Water jackets are made of copper. Wrist pins are 1⅝ inches in diameter.

**COOLING:** Centrifugal water pump.

**GEARS:** All gears and shafts are heat treated.



CHRISTOFFERSON  
AERONAUTICAL MOTOR  
4¾ BORE 6 STROKE  
1200-1400 RPM @ 120 HP  
Crank & Piston made of Aloyanum  
Water Jacket made of Copper



## THE MODEL "C" TWIN-MOTORED BENOIST CRUISER



**T**HE new Model "C" Benoist airboat differs radically in some ways from that of its preceding models in the power plant placement, but not to any great extent in other details.

No. 101, the subject of this article, is equipped with two one hundred horsepower Roberts motors set up in the planes and driving individual propellers.

The boat in design and construction follows the latest models developed by this company last season. The boat is of the short hull variety. Tom Benoist, the designer of this new machine, has always been a believer in the superior efficiency of the short hull design over that of the long hull, with its decreasing cross section of stern. In other words, the boat hull has the same width from one end to the other. This short hull has been used by the Benoists more or less ever since they developed the Benoist Tractor Hydroaeroplane in the fall of 1911. However, all kinds of designs and constructions have been used and experimented with, only to come back each time to the short hull.

Besides the differences noted above between this boat and many others, this boat is now being built without any step; although the illustrations are from photos taken of this boat when it had a step. It has been found that with the bottom construction used by the Benoist that a step is not needed, as the boat can easily get out of the water with the load possible to carry in the air, and, of course, can be constructed stronger without the step and eliminates other difficulties; especially

that of looping when about ready to take to the air, a difficulty so marked in the boat equipped with a step and narrow sterns. However, when the step is used on this hull, it is placed much further back than on some boats whose manufacturers claim that the step is approximately at the center of gravity of the machine.

The general specifications are as follows:

Spread .....	65 ft.
Chord .....	5½ ft.
Gap .....	6 to 5 ft.
Aspect ratio.....	11

The machine loaded light, that is, ready to fill up and fly, weighs 2,400 lbs.; loaded heavy, 3,700 lbs., making a useful load of 1,300 lbs.

The wings are developed from those used so successfully in preceding models of Benoist planes, but improved in construction and changed in camber to suit the special conditions required in a machine of this kind. The main wing beams are of spruce, with a cross section 2 x 2½ inches at the inner ends to 2 x 1½ inches at the outer ends. All beams and struts have been carefully tested for their crushing strength at the laboratory of the Armour Technical Institute, and must show a factor of safety of from eight to ten or the dimension of the price is increased regardless of weight until it does show this factor.

The guy wires are Roebling 19-strand aviator cable, and also must show a factor of more than eight, as must the



The new Benoist Flying Boat carrying three passengers and pilot.







# DAMPING OF OSCILLATIONS OF AN AEROPLANE

By H. K. CHOW,\* S.B.; M.S. (Aero. Eng.)

## PART I. GENERAL.

**A**N aeroplane will maintain its attitude and speed: if the air through which it travels is perfectly still, or moving at a constant speed, if the thrust of the propeller is constant, and if the disposition of weights in the machine does not change. If, however, any of the above conditions changes, and if the change take place suddenly—if the wind is gusty, if the propeller thrust changes due to the variation in engine power, or if the disposition of weights in some way varies oscillations are set up which, if not damped out within a reasonably short time, may render the aeroplane unstable, and therefore dangerous to the pilot. All aeroplanes should, therefore, have auxiliary surfaces sufficiently removed from the center of gravity to give the necessary moment to damp out the oscillations. For longitudinal and directional oscillations, the horizontal stabilizer and the vertical rudder, respectively, furnish the want, while for lateral oscillations the entire wing acts as a damper.

Much mathematical work on the stability of aeroplanes has been done in the past by Lanchester, Bryan, Ferber, Painleve, Bothezat, Reissner, Knoller, Crocco and others. Their methods have been based upon the theory of small oscillations, a well-known subject in the domain of Rigid Dynamics. Up to the present, the classical treatment on the subject by Prof. Bryan appears to be the most complete.

The National Physical Laboratory made experimental researches on the stability of aeroplanes, basing the work upon the theoretical conclusions reached by Prof. Bryan. The apparatus employed consisted of an attachment to the vertical balance such that a model of an aeroplane could be mounted in the center of the wind tunnel in a steady stream of artificial wind, and in that manner the whole combination could be made to oscillate in a vertical plane. The oscillations were recorded on a photographic plate, showing decreasing amplitude, from which damping coefficients could be calculated. The result thus obtained applied to the model but could be extended according to Dimensional Theory to full scale machines.

While the apparatus used by the National Physical Laboratory was of a very sensitive and accurate character, this very fact counts against the instrument as one which may be adopted by laboratories not so well equipped. Further objections are that the oscillations were very small and that the inertia of the apparatus was large. This heavy mass produced friction in the pivots whose damping effect was larger than the damping of the model itself.

It was with a view to eliminating the objections above enumerated, and to producing an apparatus having regard to the equipment of the laboratory at the Massachusetts Institute of Technology, that a new apparatus was designed by the writer. The apparatus has since been much improved by Lieutenant J. C. Hunsaker, my former teacher, to whom grateful acknowledgment must be made for helpful criticisms and suggestions. The result has been the production of an apparatus adapted to rapid and accurate work—the kind of apparatus in which engineers and not physicists are interested.

Briefly described, the apparatus consisted of an oscillator, mounted on a rigid base, to which was attached a model of an aeroplane whose center of gravity was about a foot over the axis of oscillation. (In the improved oscillator, the center of gravity of the model coincides with the axis of oscillation.) A horizontal beam of light, outside the side window of the tunnel, collected by an ordinary spectacle lens was thrown upon a 45° total reflecting prism, placed in the axis of oscillation, which reflected the beam upward through a top window glass. A piece of ground glass, enclosed in a dark box with an arbitrary linear scale of equal and fractional spaces, served as a screen for receiving the light which, when correctly focused, gave a sharp line of illumination. The oscillator was set in motion by depressing one side of a cross piece perpendicular to the axis and letting it go. Springs attached to the cross piece at equal distances from the axis tended to restore equilibrium but inertia carried it further than the original position, and so on. The result was an oscillatory motion. The oscillation was shown by the light on the ground glass screen, and could be observed with precision.

As will be shown later, it was the decreasing amplitude with which we were concerned. The number of complete swings for damping the amplitude to fractions of the value when count was started was carefully observed, from which, when the moment of inertia of the model was known, the damping coefficient could be calculated.

The moment of inertia of the model necessary for the calculations was obtained with the same oscillator.

The model was tested at different wind velocities, ranging from 0 to 40 miles per hour. In each case the attitude was that of normal horizontal flight. The oscillation was therefore longitudinal. For a complete test, oscillations about other axes of the aeroplane should be made, which could be done with the same oscillator by making necessary adjustments.

The above description refers to an apparatus for producing free oscillating moments, namely:

The pitching moment, due to pitching.

The rolling moment, due to rolling.

The yawing moment, due to yawing.

There are practical difficulties in the way of a design of an apparatus for producing forced oscillations, which will possess the same general features of ease in construction and operation, such as we have developed for the free oscil-

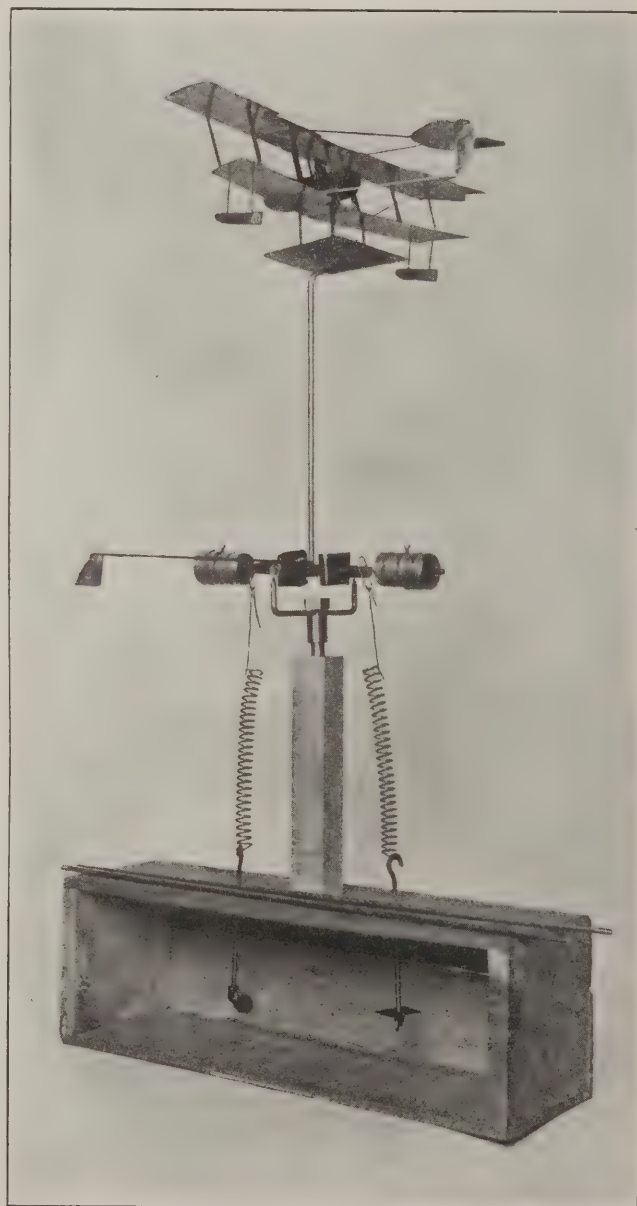


Fig. 1

\*Research Department, The Curtiss Aeroplane Company.



lations. Of the six cases of forced oscillation, the following are the important ones:  
The rolling, due to the yawing.  
The yawing, due to the rolling.

PART II. THEORY.

The system of notation used in this article is shown in the following scheme:

	Name	Symbol
AXIS.....	Longitudinal .....	x
	Lateral .....	y
	Normal .....	z
FORCE.....	Longitudinal .....	X
	Lateral .....	Y
	Normal .....	Z
ANGLE.....	Roll .....	φ
	Pitch .....	θ
	Yaw .....	ψ
MOMENT....	Rolling .....	L
	Pitching .....	M
	Yawing .....	N
SMALL CHANGES IN VELOCITY	Angular.....	p
		q
		r
	Linear.....	u
		v
		w

An aeroplane has six degrees of freedom of motion, namely three linear and three angular. A change in any of the velocities and angles will be accompanied by changes in every one of the quantities X, Y, Z, L, M, N. Hence X, Y, Z, L, M, N are functions of u, v, w, p, q, r, φ, θ, ψ. They cannot be easily expressed in any simple form. According to Maclaurin's Theorem they can be expanded into a series to the power n. But since the oscillations are small, all terms higher than first power can be neglected. For example,  
 $X = X_0 + uX_u + vX_v + wX_w + pX_p + qX_q + rX_r \dots (1)$   
 $M = M_0 + uM_u + vM_v + wM_w + pM_p + qM_q + rM_r \dots (2)$

There are equations of this character for each of the six quantities, X, Y, Z, L, M, N, and altogether there are 36 coefficients to be determined for the complete solution of the six equations. Fortunately some of the 36 coefficients are not important compared with others. We are particularly interested in the coefficient  $M_a$ , the longitudinal damping coefficient.

Let Fig. 2 represent a model of an aeroplane mounted on an oscillator. The letters have the following meaning:

- S = Spring pull in pounds.
- a = Moment arm of spring in feet.
- c = Distance of C. G. of the entire apparatus from the axis of rotation in feet.
- l = Distance of C. G. of model from the axis of rotation in feet.
- θ = Infinitesimal angular displacement.



Fig. 3

$u$  = Small variation in forward velocity.  
When the aeroplane model is displaced by a small amount  $\theta$ , then by the application of D'Alembert's principle, viz:  
Effective Moment =  $\Sigma$  Acting Moments —  $\Sigma$  Resisting Moments ..... (3)  
we obtain the following equation:

$$I \frac{d^2 \theta}{dt^2} = m X l + m M + c W \sin \theta - S a \dots (4)$$

- where
- $I$  = Moment of Inertia of the entire apparatus.
  - $m$  = Mass of the model.
  - $X$  = Drift component of the wind force.
  - $M$  = Couple of the wind force about C. G. of the model.
  - $W$  = Mass of the entire apparatus.

Making proper substitutions, we obtain:

$$I \frac{d^2 \theta}{dt^2} = (mX_0 + muX_u + mvX_v + mwX_w + mpX_p + mqX_q + mrX_r) l + mM_0 + muM_u + mvM_v + mwM_w + mpM_p + mqM_q + mrM_r + c W \theta - S_0 a - K a^2 \theta \dots (5)$$

where  $\theta = \sin \theta$  (for small displacements).  
 $S_0$  = Initial tension of the springs.  
 $K$  = co-efficient of stiffness of the springs.  
In our case  $p = 0, r = 0, v = 0, w = 0$ . Also for initial conditions  $mX_0 + mM_0 = S_0 a$ . Hence:

$$I \frac{d^2 \theta}{dt^2} = (muX_u + mqX_q) l + muM_u + mqM_q + c W \theta - K a^2 \theta \dots (6)$$

But  $u = l \frac{d \theta}{dt}, q = \frac{d \theta}{dt}, M_u = 0$  for horizontal steady flight.  
(Continued on page 284)

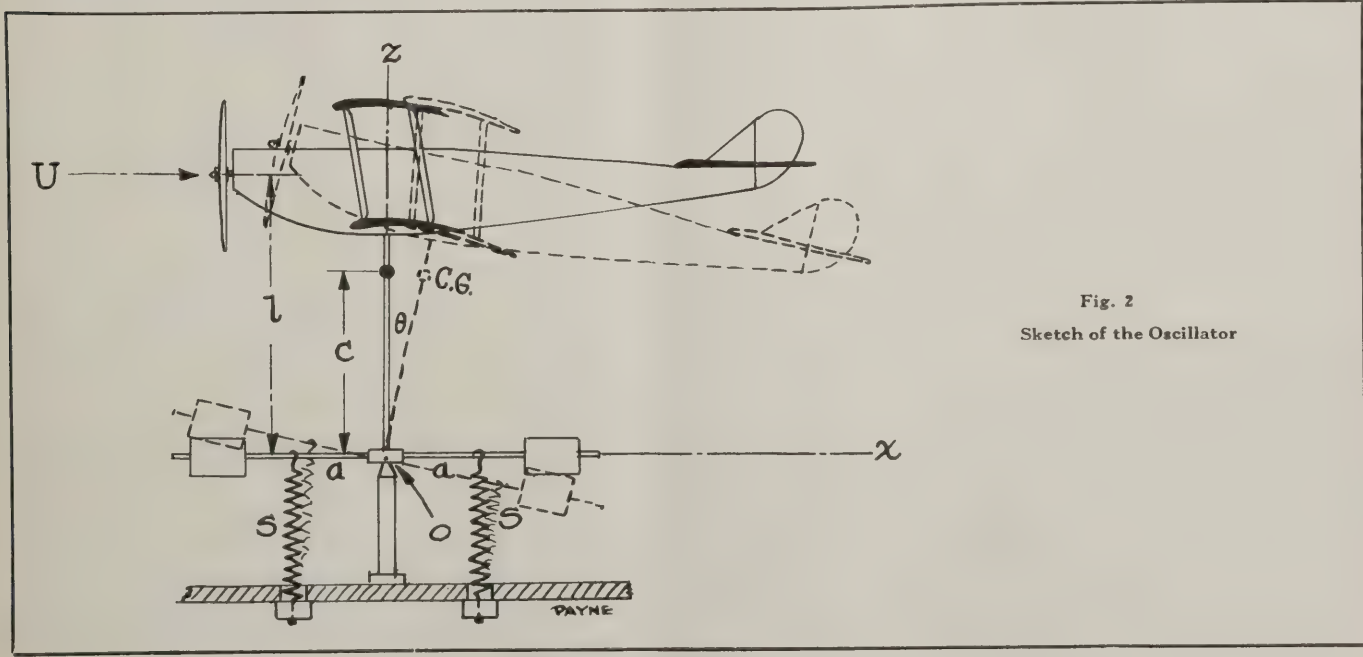


Fig. 2  
Sketch of the Oscillator

Sketch of the Oscillator





# FOREIGN NEWS



## AUSTRIA

Austrian airmen dropped bombs on the barracks and stores of Ala (the first town captured by the Italians on the Austrian side of the frontier, in the Adige Valley, about two miles across the line.) Austrian aviators have also dropped bombs on Tolmezzo.

In the Italian theatre of war, according to a bulletin issued at Vienna, an Austrian airman in a duel brought down an enemy biplane near San Lorerizu di Mossa, where it was destroyed by Austrian gunfire.

## FRANCE

Multiple powered biplanes are much in favor with army constructors. Two such machines which recently left Buc flying field for the front, astonished some observers by their ability for speed and climb. At Saint Cyr repair station there is a machine of this type which had been hit by a German shell. One motor had been demolished, the observer had been killed and the pilot wounded but the latter was nevertheless able to bring the machine back to the French lines with the remaining motor, thus demonstrating the possibilities of multiple motored machines in warfare.

France has under construction a number of four 120 horsepower Anzani motored tractors with a spread of 90 feet, the motors being in a line along the leading edge. These machines will carry guns throwing an explosive shell.

There are no less than 200 pupils in daily training at the Buc flying field, with an average course of two months.

"At Issy," writes a recent observer, "the Voisin machine is most prominent, more noticeable in the giant triplane equipped with four 140 horsepower Salmson motors in tandem, two on each side of the fuselage, with a spread of nearly 120 feet, a massive machine seating eleven people comfortably." Although still in an experimental stage this machine is doing very well.

The general tendency in France is toward a multiple motored high powered weight carrying machine with a moderately high speed, equipped with guns of the explosive shell type.

There has recently been a marked increase in the activities of the French airmen. The war office on November 28 reported three battles in the air and two successful raids. In Belgium a French aeroplane set out alone in pursuit of a German squadron and brought down one of the German machines. It fell into the sea off Westende-Bains, between Nieuport and Ostend. Allied aeroplanes and watercraft attacked a small squadron of German water craft that put out to the rescue and sank a small boat. Ten French aeroplanes on the same day succeeded in setting fire to the enemy's hangars in Habsheim, Southern Alsace, and also damaged one aeroplane that was on the ground. Two German machines which started in pursuit were repulsed, one being struck by a shower of bullets from a machine gun which necessitated a quick descent and the other was captured. Near Nancy a French aeroplane succeeded in cutting down a German machine and putting another to flight.

On the same day the war office reported the dropping of nine bombs on the railway station at Noyon by a French aeroplane, and northeast of Thesey St. Martin a French machine in an air encounter so badly damaged a German aeroplane that it fell to the ground within its own lines.

A French journal thus describes an aerial raid on Belfort in Eastern France on October 17: "About nine o'clock in the morning we heard the first shots from our forts, indicating that they were engaged in action with the enemy. Bugle calls warned us that hostile aviators were approaching and that we ought to prepare for the expected bombardment from above. Those who were in the streets could see, at an altitude of 1,500 to 2,000 metres, the first German aircraft coming toward Belfort from the east. As soon as it was above the town it greeted us with a bomb, to which our garrison replied with a salvo of machine guns. In a couple of minutes two other aeroplanes, of the Albatross type, arrived on the scene and proceeded to drop bombs on us. Some of our own aviators ascended courageously to offer fight to the Germans and we became witnesses of a lively aerial encounter.

"When the German aeroplanes had dropped all their bombs they retired eastward, only to be supplanted by another aviation squad, which acted in the same manner. This was kept up, with short intermission only, for two full hours. Finally the foreign birds disappeared, and we imagined that we were rid of them for the day at least. But just as people were sitting down to their midday meal the Germans reappeared and sent another shower of shells over Belfort, retreating again after a little while. At half-past one and three o'clock the same performance was repeated.

"The eighteen or twenty aeroplanes engaged in the raid dropped fifty bombs. The total results were two persons killed, seven wounded and a few roofs destroyed."

## GERMANY

According to German papers rehearsals intended to test the arrangements made in Bremen, Kiel, Dantzig, Hamburg and other towns to protect the people did not have the intended effect. For weeks the public had been instructed what to do in the event of an aerial attack, but when the alarms were sounded they failed to obey the instructions. Instead of following the course of action laid down by the authorities, the people flew to the streets, congregated in various places or rushed to military headquarters for protection.

## GREAT BRITAIN

Many machines of unusual construction are being flown in tests at Hendon.

The Burgess pushers, equipped with 140 horsepower motors, known as "gun busses," are especially noticeable for their efficiency, speed and climbing abilities.

At the Caudron factory the general tendency is toward multiple powered machines. This company has a two-motored biplane well under construction for use at the front.

A squadron of 23 British aeroplanes successfully bombarded a German hut encampment at Achiet Le Grand, northeast of Albert. The Germans replied with a single aeroplane, which dropped bombs near Bray, doing no damage.

Col. Maitland, of the Royal Naval Air Service, was officially asked if an airman could make a safe landing with a parachute from an altitude of 10,000 feet. Rather than ask any one else to make the test he did it himself. He went up in an aeroplane, jumped and successfully landed just outside of London.

Flight Commander Smyth-Pigott has been appointed a Companion of the Distinguished Service Order. He received the award for a daring moonlight flight from the Dedeagatch shore, fifty miles inland, to Kuleli-Burgas, in Bulgaria, where he dropped bombs on the great bridge of the Orient Railway crossing the Maritza River, the only through line to Constantinople.

Indicative of the destructive power of the larger type of aeroplanes is an eighteen-word bulletin issued by the War Office laconically telling of the breaking of a submarine into two pieces:

"In the afternoon (November 28th) a British aeroplane destroyed a German submarine off Middlekerke. It was seen to break in half." Middlekerke is on the Belgian coast.

## ITALY

Enemy aeroplanes dropped bombs on Arsiero, where no damage was done, and on Ala, where four soldiers were wounded. One of the Italian aerial squadrons bombarded the aviation camp at Assevizza, another camp being made at Aidussina and railroad stations at Vagersko, Aidussina, Reifenberg and San Daniele. The aeroplanes, which were fired upon as usual by anti-aircraft guns, returned undamaged.

## RUSSIA

The bodies of two German aeronauts, pilot and observer of an aeroplane of the Albatross type, were found on November 25 in a marsh near Dvinsk. The men had been frozen to death.

The Albatross was observed approaching and was permitted to cross the Russian lines. Its escape was then cut off by a flock of Russian aircraft. The German machine circled about frantically for half an hour, and then, when it was seen there was no chance of escape, it descended to the marsh. Cossacks started in pursuit, but did not discover the landing place until after the Germans had succumbed to the cold. The aeroplane was undamaged.

## TURKEY

Aeroplanes of the Allies last week bombarded the railway between Constantinople and Dedeagatch inflicting damage to the bridges.

A British aeroplane was shot down on the Gallipoli Peninsula on November 24. The pilot, having the rank of a major, was slightly wounded and was made a prisoner.

French Station equipped with instruments for gauging the height, distance and speed of approaching aircraft.







# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



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### The Dependence of Aviation on Model Experimental Work\*

By F. HANDLEY PAGE, A.F. Ac.S.

*Inventor and Constructor of the Handley Page Inherently Stable Aeroplanes*

The subject for this evening is "The Dependence of Aviation on Model Experimental Work." I will, therefore, endeavor to show you how dependent aeroplane designs are on model makers and research work carried out on models. I will also deal with the lines on which the research work must be carried out, not necessarily in the orthodox laboratory method, but even with experiments on what are sometimes termed "Flying Sticks." The experiments carried out on the latter should be of more interest than the small laboratory experiments if they are carried out correctly.

Let us consider the relations of models to the full-sized machines.

The whole science of aeronautics is founded on experimental work. There are many elaborate mathematical theories which deal with the theoretical side of aviation. These theories can, however, only act as pointers in the direction to be taken; they are absolutely useless without the experimental data giving the necessary constant in the fundamental equations. Let me give you an instance.

Professor Bryan has written a book on stability, containing a long series of mathematical equations defining the stability characteristics of a machine. To properly apply this to practical aeroplane design it is necessary that a large amount of experimental work must be done to find the value of this constant. For this one has to fall back on models, and thus to properly design an aeroplane one must go back to model research work.

I have shown how important it is to the science that experimental work should be undertaken. You may say, however, that experimental work on models is uncertain in its results, and has not the same value as tests on full-sized machines. This may to a certain extent be true, but experimental work with full-sized machines can only be carried out on a large scale if you are a millionaire. It is very costly, both in time and expenditure, and is attended with danger to the experimenter.

It is quite simple, of course, to make a model, having a weight in it to represent passenger, pilot, engine and petrol, etc., and let the machine fly. If it comes to grief there is no danger of lives lost nor of much time or money wasted.

You will thus see that model experimental work must be of great help to the science, although it will have to be supplemented by tests on the full-size machines.

There are two classes of experimental work:

1. The aeroplane is stationary and the wind blows against it.
2. The model moves, and the air is still.

In each case of these classes there are two problems that confront the designer: the problem of lift and drift firstly, and the problem of stability secondly. These two problems are separate as regards the research work necessary. I will deal firstly with the experiment on the stationary model with the air blowing against it.

Experiments of this kind have been carried out in this country and abroad by many experimenters, and one recalls a long series of distinguished names in connection with this work: Eiffel, Rateau and Andre de Gaumont in France; Prandtl in Germany, Drs. Finzi and Soldati in Italy, Rabouchinsky in Russia, in England Dr. Stanton and his staff at the National Physical Laboratory, and in the United States by Lieut. Hunsaker.

These people have all employed stationary models to measure the lift and resistance of many types of planes and struts

and streamline bodies. From these experiments one can tell the plane which has the maximum lift with the minimum drift, and tell how much area is necessary to lift the load which you are going to carry at the speed for which the aeroplane is designed; to tell also the thrust of the propeller, and, further, the horse-power required to make flight possible. The model experiments then determined the angle of inclination, the area, and the cross section of the plane which you are going to use. There is a further series of experiments in the wind tunnel which are most useful to the aeroplane designers; I refer to the curves of pressure distribution which have been taken on many types of planes. In this one sees exactly how the pressure is distributed from the front edge to the back edge of the plane. These pressures are measured by having a series of small holes drilled across the section of the plane, and the pressure is measured with a pressure gauge connected to each of these points.

The first interesting thing that was found out from these experiments was that the lift or suction on the top side of the planes was three to five times as great as the lift due to direct pressure underneath the planes. The top surface has therefore to be much more carefully designed than the lower one. These pressure-distribution curves are useful also in telling us how we may modify our cross section to obtain a better lift and a lower drift of the resistance, how we may modify the camber and cross section of our planes to improve the results.

There is another way in which the laboratory models are so useful for obtaining results for full-sized designs, and that is in the determination of the movement of the centres of pressures of the planes.

In this connection I would refer to the very careful series of tests which Mr. Turnbull carried out in 1906 at his laboratory at Rothesay, New Brunswick. At that time there was very little data to which one could refer on which to base the design of full-sized machines. Mr. Turnbull saw that it was necessary that an aeroplane to be successful must be stable in the air; when the angle of inclination decreased and the machine tended to dive, he saw that the centre of pressure must move forward to provide the necessary righting moment to bring the machine back to a level keel, and that the converse of these results must take place when the angle increased.

He experimented with planes of varying cross section of the type illustrated and numbered below.

The arrow of these illustrations shows the direction from which the wind blew, and the cross section of the planes upon which it blew. He found that the only plane which was self-righting in any way described above, was the combination of two and three obtained in section 4. For this type he took out a number of patents all over the world; but this section had already been used previously by Lilienthal, the famous German pioneer.

### Elmwood School Model Aero Club

By GRIFFITH BURR

On November 29th, the Elmwood School Model Aero Club was organized. This is the first model club of the Oranges, New Jersey, to be organized under the auspices of the Orange Y. M. C. A. and the Aero Science Club of America. In all probability more clubs will be organized in the very near future. At this meeting there were fifteen members present and the possibilities are that many more members will be enrolled shortly. Mr. Ted Parker was elected president, and Mr. Griffith Burr, secretary of the club. Mr. W. H. Smith, principal of the school, who is much interested in this new sport, has offered his assistance in every way possible. Mr. R. M. Jacobus, chairman of the Model Aeroplane Committee of the Y. M. C. A., and Mr. G. A. Cavanagh, Model Editor of Aerial Age, were also present.

(Continued on page 284)

\*A lecture delivered before the Kite and Model Aeroplane Association at Caxton Hall, London.



(Continued from page 281)

 $X_u, X_q$  are small and can be neglected.\*

$$\frac{d^2 \theta}{dt^2} - \frac{m M_q}{I} \frac{d \theta}{dt} + (K a^2 - c W) \theta = 0 \dots \dots \dots (7)$$

The graphical solution of equation (7) gives a curve shown Fig. 3.

The algebraical solution of this differential equation of the second order is well known. Thus:

$$\theta = \theta_0 e^{-\frac{m M_q}{2I} t} \cos \left\{ \sqrt{\frac{K a^2 - c W}{I} - \left( \frac{m M_q}{2I} \right)^2} t + \gamma \right\} \dots \dots \dots (8)$$

\*In the improved form of the apparatus I is made equal to zero, which makes the above assumption unnecessary.

If we only measure the amplitudes, then

$$\cos \left\{ \sqrt{\frac{K a^2 - c W}{I} - \left( \frac{m M_q}{2I} \right)^2} t + \gamma \right\} = 1, \text{ and}$$

equation (8) becomes

$$\theta = \theta_0 e^{-\frac{m M_q}{2I} t} \dots \dots \dots (9)$$

The expression  $\frac{m M_q}{2I}$  is called Logarithmic Decrement, and is connected with the amplitudes in the following manner:

$$\log_e \frac{\theta}{\theta_0} = -\frac{m M_q}{2I} t \dots \dots \dots (10)$$

Therefore if we know  $\frac{\theta}{\theta_0}$  and  $t$  from direct observation as

we did by using the oscillating apparatus above described, we can calculate  $M_q$ . This value when substituted into equation (7) will render possible the solution of the equation with numerical coefficients, from which the long and short periods of oscillations of an aeroplane can be determined.

The criterion of stability requires that a certain expression called Routh's Discriminant  $BCD-AD^2-B^2E$  shall be positive, in which  $C$  involves the coefficient  $M_q$  for longitudinal stability. We are thus led to see the importance of determining the coefficient  $M_q$  in stability calculations.

The National Physical Laboratory investigated the stability of a model of a machine of the Bleriot type by determining experimentally coefficients like  $M_q$  and many other less important coefficients which enter into stability calculations. The Laboratory of the Massachusetts Institute of Technology has recently made similar researches on models of machines designed and built in this country. In each case, the labor involved was very great, and there is small prospect that such labor can in any way be lessened by short-cut methods. If, however, after several weeks' research, the machine is found unstable and the design is modified to make it stable, the result certainly justifies the effort. It may mean the saving of the life of one or more aviators. The time is not far distant when aeroplane designers will be required to design machines for stability in measurable quantities just as ships have been and are designed for a certain metacentric height.\*

\*Reference to the experimental determination of all stability coefficients may be found in the paper by L. Bairstow in the Technical Report of the Advisory Committee for Aeronautics, London, 1912-13.

(Continued from page 283)

#### Milwaukee Model Aero Club

By GILBERT M. COUNSELL

The M. M. A. C. elected the following officers for the coming year: President, Clarence Bates; Vice-President, Gilbert M. Counsell; Secretary, Kenneth Sedgwick; Treasurer, Ray Maas.

The club has just closed its flying season, having established the following club records: Hand launched distance, 2,367½ feet, Mr. Lynn Davies; hand launched duration, 134 seconds, Lynn Davies; R. O. G. distance, 1,200 feet, Clarence Bates; R. O. G. duration, 97.2 seconds, Lynn Davies; single propeller tractor, duration, 67 seconds, Kenneth Sedgwick; distance, 400 feet, Kenneth Sedgwick.

#### Illinois Model Aero Club

By WARD PEASE

On the evening of Saturday, November 20, Mr. Wm. B. Stout, chief engineer of the Scripps-Booth Motor Co., and

editor of the former AERIAL AGE monthly, spoke to a combined gathering of members of the Aero Club of Illinois and the Illinois Model Aero Club at the Auditorium Hotel. His subject was "Aviation's New Possibilities" and was treated in a very interesting manner. Mr. Stout showed that in the past vigorous advertising campaigns have convinced the people of the advantage of improvements of various kinds, and that with the congestion of automobile traffic the large number of aviators and safe and efficient aeroplanes available will convince the people and bring the aeroplane to stay as a dangerous rival of the automobile.

Mr. Stout has arranged with Arthur E. Nealy, of this club, to go to Detroit, December 9, to demonstrate models and to speak at the annual banquet of the Society of Automobile Engineers, which is to be held at the Hotel Ponchartrain. He is going to take several loop-the-loop models and fly them there.

#### Commander Porte Makes Another Secret Visit

A recent guest at the Aero Club of America was Commander John C. Porte, of the British aeronautic service. As on previous occasions Commander Porte kept out of the public eye until he had completed his business in this country and had returned to his home. For if it were known to the enemies of his country that a man so valuable to the aviation service were in an accessible position, efforts might be made to intercept him on the return trip. Commander Porte came here to inspect a large fleet of "Super-Americans," which is being constructed for Great Britain at the plant of the Curtiss Company in Buffalo. He says that for marine scouting the American-made machine is without an equal in the world.

#### Mr. Hammond Estimates Our Aerial Needs

John Hays Hammond, Jr., a member of the Naval Advisory Board and the inventor of a system for controlling torpedoes by wireless returned last week from a trip to Europe made to ascertain what measures would be most readily adaptable in placing this country in a condition of adequate preparedness. Mr. Hammond in discussing with the officers of the Aero Club of America what he learned in Europe, feverently wished that Henry Ford, William Jennings Bryan and all other propagandists against adequate preparedness would go to Europe and get close to the firing lines.

"They cannot fail to realize then," he said, "that it was unpreparedness on the part of the weaker military nations which brought about the present conflict."

Mr. Hammond is of the opinion that the nations which are now in alliance against the Teutonic confederation and the Turko-Bulgarians are indirectly responsible for the war because of their unpreparedness to meet Germany's onslaught. "There is the greatest lesson of all to the United States. Had France and England been prepared for defence against Germany there is every reason to believe that the war would not have been.

"Concerning the attitude of the pacifists of this country the people of Europe are incredulous," said Mr. Hammond. "They refuse to believe that we actually discuss whether we should adopt methods of preparation for defense. Of course, they consider the matter above discussion. When I told several of them that we had but twenty aeroplanes in our army and navy equipment they thought I was misinformed. They asked me if I did not mean two thousand aeroplanes. Even that number they consider insufficient for our needs.

"That is a natural feeling in a country where it is considered that less than ten thousand aeroplanes would be inadequate for a first class military establishment under modern war conditions. The deplorable condition here is all the more reprehensible when we realize that this country gave to the world its first aeroplane."

"The United States," Mr. Hammond continued, "must organize a force that will be adequate both in the army and the navy. We must have an army and navy able to do battle with any first class power. At the beginning of the war France had 25,000 officers. Now she has 100,000. That shows how essential officers are, and we have not enough.

"Had England been prepared for the German submarine blockade at the beginning of the war as she is now things would have a different complexion. At present the submarine peril is practically neutralized by the use of nets, microphones and fast destroyers.

"In our army we need 2,000 aeroplanes, with 2,000 trained observers. The navy also needs a large force of aviators."

Mr. Hammond said that the engineers and officers in both England and France took keen interest in his inventions.

"But," he added, "my secrets are for my own country."





**Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.**

#### Aerodrome Proverbs

Look before you loop.  
It's a wrong 'plane that slips in turning.  
An *atterrissage* on land is worth two in the bush.  
One good bank deserves another.

"Why Zeppelins Come Here at Will."—Newspaper headline.  
But they don't come at him; they come from him.—*Punch*.

An aviator is the only one that can go up in the air without losing his head.—H. W. R.

#### Confidence in Their Ability

Two American aviators in the English service were obliged to land during a cross-country flight in England. The country folks plied them with questions.

"Are you the drivers of those aeroplanes?" asked one old lady, intercepting the men as they were starting for lunch.

"Yes."

"They are American aeroplanes, are they not?" she continued.

"Yes."

"Oh, really!" she exclaimed, "and have you flown from America this morning?"

Farmer, on hearing a loud buzzing above him, gazed upward. He saw a large monoplane passing over, a thing he had never heard of. It is surprised him that he muttered aloud: "Wall, I've read of 'em air flying dragons and serpents they use'ta have, but I be bless't if I ever know'd they had the tarnd critters now 'er days."—J. G. W.

It's too bad Brown's having so much trouble. It seems as though he's never free from worry.

Yep, even an aviator has his ups and downs.

Oh, my! Oh, my! cried the speculator coming into the office with a worried look on his face. If it only happened the other way.

Why what's the matter? Brown asked his sympathetic partner, you look as though you encountered a bad deal.

I did. I purchased five hundred shares of aerial bomb preferred and they took a drop.

King George carries his lunch, but the Zeppelins won't let him eat it in peace.

#### Icarus's Children

By BEATRICE IRWIN

O countless Bird Men, beating through the blue,  
Bent on your conquering quest of Time and Space,  
Glory shall give her golden mouth to you,  
And starry wonders of a new-born Race  
Shall spring from bliss of your enamored eyes,  
And, from the deathless flame-song of her breast,  
Intrepid children—balanced, grave and wise,  
Controlling energy with power to rest!

To rest, and dream of things beyond desire,  
Of mysteries, through which the Cosmos wrought—  
To dream of faces dead, and living thought,  
Whose immortality of cleansing fire  
Delivering man from spells of ancient earth,  
Through death gave the ethereal science birth.



#### ON THE FIRING LINE

**Ambitious Hatcher:** 'Tis an unusual kind of egg, thank heaven it is still warm, and I feel the throb of young life within

*Courtesy Puck*

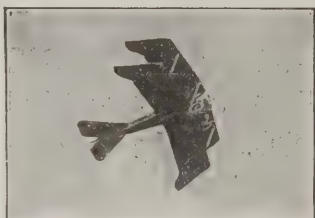


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Fills the cloth thoroughly and shrinks it moderately. It is gasoline, oil and water-proof. Can be worked smooth with sand-paper, and brought to a high gloss after three or four coats, or can be finished with any good spar varnish.

Use at least three coats, applied quickly, with a brush about two inches wide, and allow one hour for drying each coat. Price, \$3.85 per gallon, plus cost of cans or barrels.

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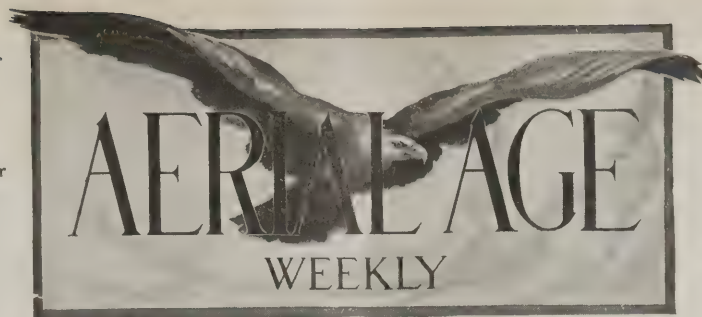


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VOL. II

NEW YORK, December 13, 1915

No. 13

### Garrison Proposes Seven Aero Squadrons

IN a tentative bill prepared by Secretary of War Garrison it is proposed to give the Army seven aero squadrons of nineteen aviation officers and 129 men each.

This bill is intended to form a basis for discussion out of which will arise the final form, therefore we will not dwell on the fact that to attach these seven squadrons to the Signal Corps, as the bill provides, would make the rest of the Signal Corps insignificant. The air service is important enough to stand alone.

### Another Submarine Sunk by Aeroplanes

ANOTHER submarine has been sunk by aeroplanes—and the story of the sinking has passed the censor, who as a rule withholds the details from the press. The following is the story of the sinking:

PARIS, Dec. 2 (delayed in transmission).—A story of the destruction of a German submarine by an allied aeroplane was related today by Lieutenants Viney and de Sincay, on their return to Paris from Dunkirk.

"It was noon on Sunday," said Lieutenant Viney. "We had left half an hour before on a French biplane, to look for submarines, which were reported nearby. We rose 10,000 feet, and had been cruising about for some time, when we saw two submarines five miles off shore, west of Nieuport.

"It was an ideal spot for our purpose. The sea was shallow, giving the submarines little chance of escape. By plunging in wide spirals, we descended on one of the boats which, being above a sand bank, could not dive. She made desperate efforts to get away, steering in wild zigzags.

"We realized we could not get her, and so turned our attention to the other boat. Apparently it was more difficult to handle her, for, despite all endeavors, she failed to get out of the circle we traced as we pounded down on her.

"We came down to about 300 feet above the sea. When we were certain of not missing, we let go the first bomb, and had the satisfaction of seeing we had made a hit. Even with the naked eye we could observe that serious damage had been inflicted on the deck of the boat.

"We circled around twice more over the doomed

submarine. A second bomb did the rest of the work. She broke in half and sank.

"We did not wait to see more. Moments were precious. We had to get back to Dunkirk as quickly as possible, for the submarines were sure to have given warning and we were liable to find our retreat cut off by the enemy's aeroplanes if we lingered."

Lieutenant de Sincay has been recommended for the Legion of Honor. It is understood Lieutenant Viney will receive the Victoria Cross.

The incident was reported first by Field Marshal French in an official communication of November 29.

### Perry Belmont Resuscitates Defense Plank of Democratic Platform

IN these days when Secretary Daniels considers himself liberal in allowing \$2,000,000 for naval aeronautics when the need is for ten times that sum, and a naval program is proposed, which does not even provide to meet the deficiency of our existing navy and serve to bring it up to the desired state of efficiency and homogeneity that the navy in its present size should have, it is significant to have a leading Democrat bring out the fact that the Democratic party seems to have forgotten that it was the sponsor for the "New Navy."

Mr. Perry Belmont, who is one of the foremost civilian naval authorities in America, one of the most prominent Democrats of the country, and who was a delegate to the Democratic National Convention of 1912, which nominated President Wilson, declares in a letter written to Henry A. Wise Wood, Chairman of the Conference Committee on National Preparedness, that the failure of the administration from the outset to recognize the necessity of materially strengthening our naval and military establishments deserves the severest condemnation. Mr. Belmont quotes a plank from the Democratic platform of 1912 that covers the vital issues now before the country. His letter follows:

DEAR MR. WISE WOOD—In reply to your letter of November 24th, forwarded from Washington, the resolutions adopted November 17th, should not, it seems to me, have created the impression that the Administration Naval Program had been approved by the Navy League. Speaking for myself individually, and not as a director of the League, the failure of the Administration from the outset to recognize the necessity of materially strengthening our naval and military establishments, for the maintenance of our rights and obligations as the greatest of neutral powers, deserves the severest condem-

**AMERICA MUST BE RESTORED TO THE POSITION OF SECOND NAVAL POWER.  
EVERY CONSIDERATION OF ITS SECURITY DEMANDS THIS SHALL BE DONE AT ONCE.  
THE PEOPLE WILL BE SATISFIED WITH NOTHING LESS.**



nation. A resolution to that effect would have my support. Even treaties of peace and arbitration require a policy of national defense to ensure or to compel their observance. Failure to provide against the helplessness and impotence of neutrals, in the face of repeated breaches of international agreements and violations of the law of nations, has been the record up to the meeting of the Congress about to assemble.

To disapprove of the program of Secretary Daniels does not involve criticism of a personal character. Nothing is more unpleasant than to find fault with the official acts of a man of such kindly nature as the Secretary of the Navy. His appointment can only be viewed as political; therefore the appointing power should bear the responsibility and to the appointing power should be directed the criticism. If opinions in regard to questions of vital importance to the national welfare are held with sufficient conviction of their correctness, emphatic statements, provided they are not personal or actuated by personal motives, are the most effective in securing Congressional action. Clear and direct arguments are needed, unhampered by qualifications intended to soften and thereby weakening them.

At a public dinner given to Mr. Daneils in Washington, in May 1913, at which Secretary Bryan was present, I took occasion to repeat what I had said many years before while in Congress, in regard to the exclusive guarantee on the part of the United States of the neutrality of an Inter-oceanic Canal, as requiring a powerful navy of the first rank and a large increase of our land forces. That requirement is still further emphasized by the responsibility of our sovereignty over the Canal Zone and the obligations on account of new and remote dependencies. It was owing to this conviction that I had previously acted as a delegate of the Navy League at Baltimore, while a member of the New York delegation to the National Convention of 1912, and was able to secure the adoption in the Democratic platform of the following resolution:

"We approve the measure reported by the Democratic leaders in the House of Representatives for the creation of a Council of National Defense, which will formulate a definite naval program with a view to increased efficiency and economy. The party that proclaimed and has always enforced the Monroe Doctrine and was sponsor for the New Navy, will continue faithfully to observe the constitutional requirements to provide and maintain an adequate and well proportioned navy sufficient to defend American policies, protect our citizens, and uphold the honor and dignity of the Nation."

That provision of the platform, covering what is now the paramount and vital issue before the country, has remained unacted upon, notwithstanding the lessons of a world-wide war.

Even if the building program of the General Board itself should be immediately adopted, it would be impossible, under four or five years, to complete the construction of the proposed fleet. The loss of the essential element of time cannot be retrieved by any pronouncements and proclamations of change of attitude today. It can hardly be expected that the responsible officials should be extravagantly praised for finally consenting to close the door after the horse had been stolen. We can only patiently and persistently continue to press upon the attention of Congress the subject of the National Defense, and the required increase in our sea power and land forces as recommended by the expert authorities of the military and naval branches of the public service.

Very sincerely yours,

PERRY BELMONT.

The policy expressed in the plank Mr. Belmont quotes from the Democratic platform was adopted long before the European war when the weakness of our army and navy had not yet been shown up in the light of the tremendous powers who are not in sympathy with American ideals and who may for economic reasons oppress us if our country is unprotected. There is therefore no excuse for the stand taken by such men as Kitchin, Bryan and Bailey, who oppose the reasonable demand that this country be restored to the position of a second naval power.

Mr. Belmont, who thus points out the promises made in 1912, was a member of Congress as early as 1881, and he has served as chairman of the Committee on Foreign Relations. He has also been United States Minister to Spain.

## Lack of Aircraft

[Editorial in Chicago Tribune]

THE Aero Club of America has been organized to supply the army and navy with aeroplanes, first by encouraging voluntary subscriptions and later by urging legislative action. If successful the club will be in a position to furnish the government with an air service, which in modern warfare is an eye of the army.

Air reconnaissance is no longer an experiment, and an army and navy without it is blind. Yet, counting everything in sight, the United States government has less than twenty aircraft. In an encounter with a modern power we would be left standing as helpless as a blind man.

The United States has five aeroplanes in the navy, twelve in the army, and two in the national guard. We should have 1,000, but neither the army nor navy departments have sufficient appropriations to equip themselves at present. Until there is a more liberal budget we shall have to depend upon private initiative. In France, Germany, and Italy there was a development of the air service by citizens, but our government hasn't the excuse that the European governments had. The military aeroplane was a guess in those days. Experiments were necessary and there was time. To-day the aeroplane is an accepted fact.

Hereafter the aeroplane is a part of preparedness. Against a European power we would only be on a level if we applied our best and most vigorous efforts studying the air and training thousands of men as observers and pilots, in the regular army as well as in the militia. Against Mexico we would be fighting at a distinct advantage, and the period of bloodshed would be shortened for both sides as a result.

Until the government takes up the development the United States will have to depend upon volunteer services from the rich young men. Aeroplaning should take place of following the hounds, of polo or big hunting. It is just as strenuous and sufficiently dangerous. It takes money, sporting instinct, and patriotism.

## Aeroplanes Important

(Editorial in Wichita (Kansas) Eagle.)

THE importance of aeroplanes in modern warfare is emphasized by the Aero Club of America, which claims that Russia's defeat in the campaign in Poland was due largely to the lack of aeroplanes, for reconnoitering, controlling artillery fire, and preventing the German airscouts from mapping the Russian possessions.

The reports which have been received from a score of reliable sources since the beginning of the war, show the comparatively small German forces, possessing a large number of aeroplanes and experienced aviators, have had a tremendous advantage over their foe and have been able to advance through difficult country and take fortified places in spite of the overwhelming Russian hosts.

At the beginning of the war there were about eight hundred aeroplanes in Russia and about one thousand in Germany. But Germany had about one thousand fully trained aviators, whereas Russia had only about four hundred, most of whom had only qualified as pilots and had not had any experience after that in military work. The aeroplanes available in Russia were of many types, with different kinds of motors and different controls, and men who had only operated one kind of machine for a short time were not able to pilot other types. Many of the machines were only light monoplanes and had to be discarded. A few large Sykorsky aeroplanes could not be used for a time because they required large fields for starting and landing. They are also slower than the German machines and easy targets for anti-aircraft guns. For this reason the ten Sykorsky aeroplanes could not render maximum service. While the German aviators have each had an average of four aeroplanes ready for their use, the Russians had to wait for their machine to be "tuned up." The Russian aviators, lacking experience, went out only occasionally, and saw little; the German aviators maintained a constant air patrol, and brought back detailed accounts and photographs of the Russian positions.

It is now realized that the aeroplane is as important in warfare on land as the submarine is to warfare on sea, and the Aero Club of America is bending its efforts toward securing an adequate number of aeroplanes and trained aviators for this country as one of the most important features of our national defense.



# THE NEWS OF THE WEEK

## Six Curtiss Model JN-2 Military Tractors Equipped with Curtiss Model OX 90 H.P. Motors, Make 450-Mile Tour

November 19—First lap of 60 miles to Wichita Falls, Tex., covered in 45 minutes.

November 20—One hundred and fourteen miles to Fort Worth made in two hours through a strong head wind.

November 22—Owing to bad weather all machines flew at a height of 5,000 feet and covered the 90 miles in just 90 minutes.

November 23—During fourth lap of 108 miles to Austin, four machines became lost in fogs. They were up about four hours before landing at Austin. Weather conditions forced them to remain at Austin two days.

November 26—Last lap to San Antonio of 78 miles made in 90 minutes. Total, 450 miles.

There was no trouble with machines or motors. The tour was particularly interesting insofar as it was a test of this type of machine under varied weather conditions.

## Katherine Stinson in San Diego, Cal.

The residents of San Diego, Cal., are not strangers to the work of experts in aviation but they were nevertheless much astonished and delighted at an exhibition given there on November 21 by Katherine Stinson, the girl aviatrix. Of course, there is something startling in the daring of so small and so youthful a figure as Miss Stinson flying into the clouds, but besides that, the little lady gave the spectators a new idea of the possibilities of aviation. The perfect control and the grace with which the aeroplane was handled, the rapidity and confidence with which it rose, and the lightness with which the landings were made, caused even the experienced observer of aviation events to marvel. Miss Stinson made two flights and in the first she introduced for the first time in the Far West, the "dippy twist," loop, a vertical bank, permitting the biplane to turn wing-over-wing as the apex of the bank was reached. In the second flight Miss Stinson made eight loops, flew upside down for thirty seconds, drove the machine a series of "spiral spins" and, making two more loops, dove 1,000 feet to a perfect landing.

At the conclusion of the exhibition she received a tremendous ovation. From San Diego Miss Stinson went to Los Angeles and to San Francisco to fulfill professional engagements.

## Won Lease to Oil Lands with an Aeroplane

In rushes and races for lands and for leases all the daring things that have been done in the past in the Oklahoma oil district are now of lesser interest than the feat accomplished

on December 2 by a representative of the King Wood Oil Company of this place. He beat his rival, E. W. Gill, to the farm of Tony Webb by using an aeroplane, while Gill thought he was making fine speed in an automobile. Webb is an Indian, owning oil producing lands. The oil rights had been under lease for some time, but expired a day or two ago, and the parties interested made an agreement that the first one to reach Webb after the lease expired could take the right from him for another period. Each had bid the same amount for the lease and neither was willing to go higher.

Gill placed his reliance on a motor car, but the representative of the King Wood Company had made arrangements with Fred Roberts, who conducts an aviation school here, to take him to the oil lands by air line, and though the automobile had a start of four miles the transaction had been closed when Mr. Gill arrived on the scene. The lease has a value of several hundred thousand dollars.

## Hydro-aeroplane Altitude Record Broken by Lieut. Saufley in a Curtiss Machine and with a Curtiss Model "OX" Motor

On November 29th, at Pensacola, Florida, Lieut. R. C. Saufley, U. S. N., broke the world's altitude record for hydro-aeroplanes by climbing 11,616 feet in one hour.

Lieut. Saufley flew a Curtiss Model "E" hydro driven by a Model "OX" 90 h.p. Curtiss motor.

The previous altitude record for hydro-aeroplanes was held by Lieut. Bellinger, who recently ascended to a height of 10,500 feet.

## Maine Aeronautical Coast Patrol Association Incorporated

Articles of incorporation have been adopted by the Maine Aeronautical Coast Patrol Association, which recently met in Portland, Me., and Rear Admiral Robert E. Peary has accepted the presidency of the organization.

## Glen Harris of Elmira an Aviator

Glen Harris, of Elmira, who entered the Thomas School at Ithaca last April, has completed his course in aviation. He may enter the service of the United States.

## The Aviation School at Oklahoma

There are three aviators and one aeroplane at the Roberts Aviation School in Okmulgee, Oklahoma, and two more machines are on their way there for the opening of the school. The field, donated by the city, has been graded, and the hangar has been finished and is ready for occupancy.

Mr. William E. Boeing, President of the Aero Club of the Northwest, piloting his Glenn L. Martin seaplane. Mr. Boeing flew over Seattle a short time ago, dropping cardboard bombs, graphically pointing out the necessity of national preparedness—and particularly aerial preparedness.







Latest photograph of Oscar A. Brindley, who made the best record for the Curtiss Trophy. He flew Martin military tractor No. 37, equipped with eight-cylinder Curtiss motor.

#### The Glenn Martin Exhibit in Los Angeles

The aeronautic display made by the Glenn L. Martin Company at the Broadway Automobile and Flower Show, held in October in Los Angeles, was easily the best attraction of the many interesting things shown. It cost the company \$30,000, occupied over 30,000 feet of floor space and was viewed by over 100,000 persons. The exhibit was of special educational value because twice each day a lecture was given on the development of aeronautics, particularly in the West. The machine exhibited was a Martin Tractor Model "TT," seating two persons and capable of carrying enough fuel for a flight of nine hours. It was a duplicate of the tractors being furnished by the Martin Company to the United States Signal Corps training station at San Diego, Cal. The motor exhibit was of special interest, as it included among others the latest Martin creation—a 150 h. p., eight-cylinder "V" motor weighing 400 pounds. The company has been showered with congratulations upon the wonderful advance made as demonstrated by the exhibit. Next spring the company expects to exhibit one of its late models in New York that Western enterprise may be more fully appreciated by the buyers.

#### American Society of Aeronautic Engineers

There will be a meeting of the directors of the American

Society of Aeronautic Engineers on Jan. 13, the day following the annual banquet. The purpose of this meeting will be to:

1. Confer upon important matters with appointees upon the Naval Consulting Board with a view to directing their course of action in the interest of aviation in its various branches.

2. Develop plans and decide on dates for stated and annual meetings.

3. Organize the general procedure and work of the Society.

4. Make program for meetings and papers at the coming convention. The Society already has promise of a number of most interesting papers on vital topics.

It being desirous to have as many papers as possible on all subjects of interest to aeronautic engineers, a general request for suggestions for papers is made.

Special sessions will be held at the convention for the most important problems, such as aero motors and the standardization of parts and names. In this case, the procedure could be somewhat as follows:

Assistant Constructor Richardson, or some other representative naval officer, representing the buyers and users of motors, opens the discussion, stating the troubles he has met in trying to secure efficient aero motors. The constructors, reading the papers, explain why there are such deficiencies. Since motor troubles are caused by:

- (1) Fault in principle of motors.
- (2) Defective ignition.
- (3) Defective cooling.
- (4) Defective carburetion.
- (5) Defective oiling system.
- (6) Careless or defective workmanship.
- (7) Defective material.
- (8) Lack of motor sense on the part of those using motors.

In their papers the constructors will tell what part any or all the above have contributed to motor deficiency and state, as much as practicable, what has already been done and what still remains to be done to solve any problem.

Papers on radiators and magnetos will be read by experts explaining what they are doing to adapt their products to the requirements of aviation.

A committee of three naval instructors has been appointed by Commander Mustin, U. S. N., to submit a report on the standardization and nomenclature of aeroplane parts. This will be placed before the Standards Committee of the Society which will transmit it to the manufacturers to the end that a definite set of standards may be proposed to the convention.

#### Annual Convention and Show in May

The first annual convention of the American Society of Aeronautic Engineers has been postponed until May, when an aero show will be held in New York and at the same time there will be an aviation meet at Sheepshead Bay. The change in date is due to the inability of manufacturers of aeroplanes and motors to prepare their exhibits by January.

#### National Guard Flight in Nebraska

Captain McMillen on November 20 made a flight in the aeroplane U-2 from Lincoln to Omaha, Neb., in connection with a theoretical maneuver of the National Guard. "Bombs" were dropped along the route, and photographs were taken at points indicated by the commanding officer.



Robert Glendinning, the Philadelphia banker, an ardent supporter of the National Defense movement, who is a licensed pilot, is here shown piloting his own machine.



### Engine Used on Carlstrom's Great Flight Equipped with Berling Magnetos

The fact that American magnetos have been perfected to a point where they equal the best German products, was brought out vividly in the recent tests of the Curtiss Aeroplane Company, by which their aviator, Victor Carlstrom, flew from Toronto, Ontario, to New York City, with only one stop, and that stop due to the shortcomings of the human engine rather than the two magnetos of the 8-cylindere motor which drove the big 90-foot-wide man-made bird on its 600-mile flight.

It is a coincidence that while the Berling magneto first became known in the motorcycle field, likewise Glenn Curtiss, himself, started in the motorcycle business, and got his ideas of speed and compactness of engine from the two-wheeled flyer. It was natural that when he began to make his aeroplanes for heavy service, he found in the motorcycle field an answer to his questions of ignition.

Here was the big problem the Curtiss engineers faced—the job of having sparks delivered to a motor whirling at the rate of 4,000 revolutions per minute, and have those sparks delivered with a certainty and regularity sufficient to insure going—because, to stop, often meant death.

So the Berling magneto was adopted. This had been invented by a Swedish engineer of that name—by a man who had spent the best years of his life in training for, and working out, the design of this magneto.

Here, at last, was a spark-giving machine that would stand a whirl of 4,000 revolutions per minute—not for one hour—but for many hours, so wonderful was its insulation.

Ten thousand motorcycles had proved the fact that the Berling would give a good spark—no matter how slow or how fast this magneto was driven. Likewise, the finest motor-boat engines, namely the Sterling and Van Blerck, had confirmed that truth. Was it any wonder, then, that the Curtiss people had selected for the vital part of its record-breaking flyer the Berling magneto?

After the Berling had been proved out on many Curtiss aeroplanes, Aviator Morris took his military tractor above the clouds and broke the American record for altitude. He gave thanks to the dependability of the two Berling magnetos which gave him his ignition.

Yes—his engine had two magnetos. That was where Glenn Curtiss' masterful engineering practicality came in. He figured that two magnetos would not only give him double spark, but would give him double probability of safety.

Carlstrom had this to say about the engine and the two big Berling magnetos, with which it was equipped:

"This engine could run another twenty hours. I never sat behind an engine that worked more perfectly. It just sung all the way from Toronto to this town. It never missed an explosion at the varying speeds I had to use, nor in the quick changes of atmospheric pressure and temperatures."

### Remarkable Performances of a Curtiss Model "V-2" Motor

On Thursday afternoon, December 2, a Curtiss V-2 motor completed a one-hundred-hour wide open test, making a total of 107 hours this motor had been run at a speed of over 1,300 r.p.m. and developing always over 160 h.p.

Previously the motor had been given 86 hours of preliminary running at speeds under 1,300 r.p.m.

The most notable feature of the performance is that the bearings, although having never been adjusted, are in perfect



Victor Carlstrom, who made a remarkable flight from Toronto to New York City.

condition, the same as after the usual five-hour shop tests.

This performance is equal to three months of military service, as in actual flying the full power of a motor is used but a small part of the time.

Model V-2 Curtiss 160 h.p. motor No. 3077 was put on a Sprague electric dynamometer and started at 8 a. m. November 24th, and was run under these conditions for eight consecutive hours at 1,400 r.p.m.

The motor was then put on a testing stand and run for 17 continuous hours with a calibrated paddle attached and at a speed which developed always above 160 h.p. It was stopped to allow some slight alterations in the magneto. After a delay of only a few minutes, it was again started and at the same speed was run continuously for 66 hours and 30 minutes, when it was stopped only to make some specified propeller tests. At the end of 66½ hours' full power running, an examination showed the motor to be in perfect condition.

Harry Payne Whitney's Burgess-Dunne seaplane which is to fly in Florida this winter.





## ALBERTO SANTOS-DUMONT VISITS CURTISS BUFFALO PLANT

**M**R. Alberto Santos-Dumont, the Brazilian sportsman, and Messrs. Henry Woodhouse, of the Aero Club of America; Lansing K. Tevis, of San Francisco, and G. Douglas Wardrop, editor of Aerial Age Weekly, were in Buffalo on November 19 as the guests of Messrs. Glenn H. Curtiss, Judge Monroe Wheeler and Mr. Satterfield, the president of the Aero Club of Buffalo.

The party was shown through the Curtiss plants at Churchill Street and Elmwood Avenue, where they saw what they characterized as the best equipped aeroplane and aero-motor factories in the world. The visitors marveled over seeing nine flying boats of the "America" type on the floor in the Churchill Street factory.

Mr. Santos-Dumont, after looking over the huge flying boats equipped with two 160 h.p. Curtiss motors and capable of carrying a ton at a speed of seventy-five miles per hour, and comparing them with his early aeroplane with which he made short jumps of about twenty meters in 1906, expressed the sentiments of the party when he said: "This aeroplane is the realization of our dreams of ten years ago."

The visitors saw one of the 160 h.p. motors with which the "America," "Super-America," "Canada" and the Model "R" are equipped being tested. The motor had already run five hours when the party went into the testing room. A chart was made while the party was present. It started at 120 h.p. at 1,000 r.p.m. and ran steadily to 182 h.p. at 1,500 r.p.m. From an engineering point of view this curve is an excellent one, and a long run on the dynamometer and on the block under its own power showed scarcely any vibration, with the motor running as smoothly as a clock.

Later an O. X. motor was given a run on the dynamometer, during which it developed as high as 89 h.p. at 1,400 r.p.m.

More than twelve years of practical experience in the building of aeronautical motors is back of the engineering department of the Curtiss Motor Co. It is an interesting fact that Charles M. Manley, pioneer aeronautical engineer, who built the original motor for Prof. Langley's aerodrome, the first flying machine built, is the chief consulting engineer at the huge Curtiss plant in Buffalo, and Charles Kirkham, whose aeronautical motor experience dates back to the early days of American aeronautics, is the chief designing engineer.

When Messrs. Manley and Kirkham were complimented on the excellent running of the motors the party had seen,

Mr. Kirkham pointed out that on November 12, at Hammondsport, N. Y., an OX motor was given a 24-hour run wide open. At the finish of the 24 hours the motor was running well and did not lose any speed. It was then throttled down to 1,200, which is a normal flying speed, and allowed to run 24 hours more.

There are twenty inspectors doing nothing but test the motors. The very latest scientific instruments are used and any part that shows the least defect, nearly always invisible to the eye, are rejected.

The factor of safety insisted on for the aeroplane itself is that it should be eight times stronger than any practical demand. The war requirements have made this almost obligatory. For instance, the wings are tested for a carrying weight of more than 13,000 pounds, when they will be expected to lift only about one-eighth of this.

The hundreds of cylinders stocked up at the Elmwood Avenue place surprised them greatly. The cylinders are tested by putting them under pressure many times greater than the pressure which they must withstand in general use, and the inflection of the cylinder under this greater pressure is measured by a special apparatus.

The visitors were gratified to find that Mr. Curtiss had solved the problem of getting suitable steel and magnetos for aeronautical motors, as noticed in our last issue.

Although very busy, the Curtiss companies carry on extensive experimentation to improve aeroplanes and motors, as well as propellers and general equipment for aeroplanes. As Mr. Santos-Dumont said: "It is remarkable to see such close attention given to the possible improvements at a time when the business pressure is so great."

Mr. Lansing K. Tevis, who had visited all the British, French and German aeroplane factories, stated that he had not seen any factories so complete anywhere.

The party was at the Buffalo Country Club for lunch. After lunch they motored to Niagara Falls, where they were met by Superintendent Harry K. Eckert and Treasurer Clarence H. Atwood. A tour of the Niagara Reservation, both the New York and the Canadian side, was made, and notwithstanding weather conditions, the natural beauties of the Reservation and the majestic Falls were greatly appreciated. Mr. Santos-Dumont recalled the fact that only a few years ago the Falls had been flown over for the first time by Lincoln Beachy in a Curtiss machine. Mr. Dumont had not been in Buffalo or Niagara Falls for twenty-four years.



All the testing at the Curtiss Aeroplane Co. plant is done in the most approved scientific fashion. The illustration shows a device for testing cables.



# STATES ORGANIZING AVIATION SECTIONS

## New York National Guard Signal Corps Organizes Aviation Section

Definite steps have been taken to organize the aviation section in the signal corps of the New York National Guard for which \$12,250 was subscribed through the National Aeroplane Fund.

R. C. Bolling, who has been appointed First Lieutenant in the Signal Corps, is in command of the Aviation Detachment, which already includes the following gentlemen, all of whom are learning to fly at Garden City: J. E. Miller, George Von Utassy, Fairman Dick, Joseph H. Stevenson, Benjamin Moore, Frederick H. Cruger, Charles Reid, Lorbert Carolin, W. D. Andrews, Meredith Blagden.

Major William S. Hallahan, Chief Signal Officer, gives the latest developments in the following letter to Mr. Alan R. Hawley, president of the Club:

My dear Mr. Hawley:

You will be pleased to learn that progressive steps in the organization of the Aero Company, Signal Corps, N. G. N. Y., are advancing as speedily as possible.

Mr. Raynal C. Bolling has been nominated for the grade of First Lieutenant, Signal Corps, and will be placed in command of the new company when it is mustered into the service.

Anticipating the organization of the company, we have contracted for the use of the Gallaudet equipment at Garden City, Long Island, including the use of two biplanes, the services of a pilot and mechanics.

I trust the work now being done and the results I anticipate from it is in line with the wishes of the contributors to the National Aeroplane Fund for this purpose.

With best wishes, believe me,

Very sincerely,

(Signed)

WM. L. HALLAHAN,  
Major Signal Corps, N. G. N. Y.,  
Chief Signal Officer.

The sum of \$12,250 has been transmitted to the National Guard authorities. The men will learn to fly with the Gallaudet machines, then next spring will visit the representative aeroplane concerns and eventually select the machine to purchase.

## National Guard and Naval Militia at Buffalo Want Aeroplanes

Mr. John M. Sattersfield, president of the Aero Club of Buffalo, has advised the Aero Club of America that the National Guard and Naval Militia, stationed at Buffalo, are anxious to get aeroplanes and the Aero Club of America has assured him that the Club will assist in every way possible to meet this need.

## Rhode Island Militia Has \$20,000 for Aeroplanes

With about \$20,000 on hand to pay for organizing an aviation section the Militia of Rhode Island is in a position to start organizing immediately.

Unfortunately, Mr. George I. Scott, who started the subscription in Rhode Island, died suddenly on October 29. A few days before his death he had had a number of consultations with the officials of the Aero Club regarding the steps to be taken to start the aviation section for the Militia of Rhode Island, but he died before he could put them into effect. His daughter, Miss Mimi Scott, who is anxious to realize the wishes of her deceased father, has been appointed special representative of the Aero Club of America, to act in her father's place on the Rhode Island Committee.

## Massachusetts Militia Anxious To Start Aviation Section.

### Bostonians Order Aeroplanes for Defense Purpose

The Militia authorities of the State of Massachusetts, who received \$12,500 through the National Aeroplane Fund for each, the National Guard and Naval Militia, to train officers in aviation, realizing the need of aeroplanes in the Militia and of training officers in aviation, applied to the War Department to arrange for the instruction of officers. In a recent letter to President Alan R. Hawley, of the Aero Club of America, Mr. Garrison has stated that Militia officers could be instructed at the Federal Government's expense at the Army training school at San Diego, if the equipment there permitted, and Mr. Hawley advised the Massachusetts authorities.

According to the following letter received from Adjutant-

General C. H. Cole, conditions of the U. S. Aviation School do not permit training of officers at the Government's expense:

"I am in receipt of a communication from the War Department in which they state the attendance of officers and enlisted men of the Organized Militia at the Army Aviation School is undoubtedly admissible under the terms of Section 16 of the amended Militia Law.

"They state further that, in view of the fact that the appropriation for aviation for the Army is so small, it is requested that the State of Massachusetts provide an aeroplane, or be willing to pay for all breakage that may occur during the instruction of its officers.

"In view of the statement made in Par. 2 of this letter, \$1,250 would not be enough to either purchase an aeroplane or sufficient in size to take care of all breakage which might occur.

"Therefore, it would seem that the \$1,250 for the land forces of this State could not be used at the Army Aviation School under the conditions imposed.

"We are at present at work upon a proposition to raise an Aviation Section for the Naval Militia and are in touch with gentlemen who are considering the proposition of building two aeroplanes for this purpose. If anything comes of this action, the money might then be used for the instruction of the land officers by our Naval Militia Aviation Section.

"Very truly yours,

(Signed)

"C. H. COLE,  
"The Adjutant-General, Chief of Staff."

## Missouri To Raise \$20,000

The sum of \$20,000 to pay for two aeroplanes for the State Militia and Naval Reserves and training of officers and for general equipment is to be raised in Missouri. Mr. A. B. Lambert, governor of the Aero Club of America at St. Louis, has organized the Missouri Aeronautical Society, which will take up the work of raising the funds.

The Aero Club of America has offered to add 10 per cent. to any sums raised before February 1.

## California Militia Aero Corps Hold First Field Drills

The following report of the first field drill held by thirty-six members of the new Militia Aero Corps of the Militia of California is of interest.

An aero corps for Los Angeles, equipped by and under the jurisdiction of the United States War Department, is now a reality. This new branch of defense for the Pacific Coast, which is the first important step taken west of New York City in the nation-wide campaign for preparedness, was positively assured yesterday when the Aero Corps of the Ninth Division of the California Naval Militia, comprising thirty-six young men, held its first field drill on Glenn Martin's temporary aviation field at Greening.

At the last session of Congress, immediately following the announcement that aero militia corps, if established throughout the country, would receive the support of the War Department in an advisory and a financial capacity, the officers of the naval militia division of this city formed the aero corps. That was two months ago. Since then the members of the aero corps have been receiving instruction in aeronautics at the State Armory at Exposition Park. This course consisted of lectures by Glenn Martin and instructions in assembling aero motors. Instruction has also been given to members of the corps at Martin's aeroplane factory.

Having gleaned all the knowledge of aeronautics that could be had beneath a roof, it was found necessary that the future birdmen should have practical experience in flying while Congress was considering the plan of providing two war aeroplanes and other equipment for the proposed aero station. The trip to the Greening aviation field was then taken.

Preliminary instruction in actual flying was given and the officers were taken on short instructive flights by Floyd Smith, instructor of aviation of the Martin School.

These instructive flights will be continued regularly for the petty officers and yeomen of the reserve who are to become pilots.

At the aviation field there was a representative gathering of authorities on aeronautics. Besides Martin and his instructor, Floyd Smith, Lieut. Douglas R. Netherwood, of the First Aero Squad, stationed at San Diego, was present for the Government. He made the trip from Bakersfield to this city Saturday afternoon by aeroplane, crossing the Tehachapi Mountains en route, especially to witness the first field meeting of the Aero Militia. He is to leave within a month for the Philippine Islands with four seaplanes and eight pilots, where he is to establish a Government aero station.

A. J. Macey, aviator and inventor of an electric stabilizer, also witnessed the first manoeuvres of the corps. Caleb Bragg, the wealthy auto racer, who has recently taken up aviation, and who gave the people of this city a few thrills last Thursday by flying over the business section, is also actively interested in the Naval Militia.

Those who comprise the California Aero Militia are: Lieutenant Seaver, commanding officer; Lieutenant Taylor, Ensign Simpson; P. L. Peroni, chief master of arms; H. L. Hahn, chief machinist; W. S. Wilson, quartermaster, first class; F. W. Gardner, machinist, first class; R. A. Muirhead, master carpenter; E. W. Braun, H. V. Reynolds, pilot; J. G. Weyse, W. K. Levering, Ed Musick, pilot; Ray Mitchell, W. A. Searis, machinist; F. B. Jones, W. Fox, C. Schultz, H. Lagois,

(Continued on page 310)



## THE NEW VAN BLERCK EIGHT- AND TWELVE-CYLINDER AERONAUTICAL MOTORS

**T**HE Van Blerck Motor Co., of Monroe, Michigan, is now marketing eight and twelve-cylinder all-steel aeronautical motors. These motors are of the four-cycle, V-type, with cylinders  $4\frac{1}{2}$ " bore by  $5\frac{1}{2}$ " stroke. All parts are made of steel or bronze—no aluminum or aluminum alloy of any kind enters into the construction of this motor.

The lower crank case is made of steel and high-grade stamping metal, and is bolted directly to the upper half. The oil reservoir provides sufficient capacity for five hours' running at full power, and increased capacity can be provided if desired to meet greater endurance requirements.

Oil is forced under pressure to all bearings by means of two duplex oil pumps submerged in oil, one on each side of the crank case. One side of each pump drives the oil through the hollow crank shaft to bearings and the other side returns the surplus oil from crank case back to reservoir. The oil reservoir is entirely separate from crank case chamber.

Under no circumstances will oil flood the cylinder. The oiling system is not affected in the least by any angle of flying, and the machine can completely capsize without flooding the motor.

An instrument is provided and mounted in view of driver to show at all times the amount of oil in reservoir. There is a pressure gauge also mounted in front of the driver indicating at all times the pressure in the oiling system.

The cylinders are made of high-grade machine steel, cut from the solid billet, and are accurately ground to size. Cylinders are bolted to crank case with chrome nickel steel studs and bolts with nuts securely locked.

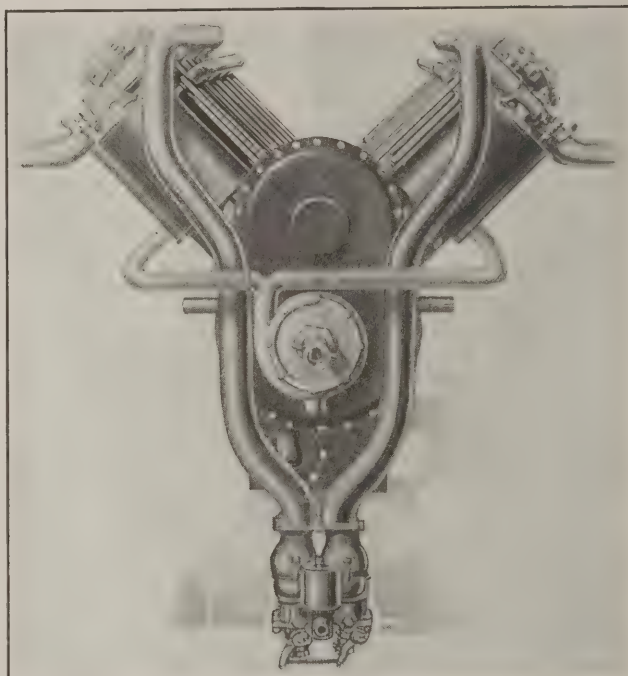
The water jackets are of suitable non-corrosive metal. Cooling water is furnished by centrifugal pump running at crank shaft speed.

The pistons are made of cast iron accurately machined and ground to exact dimensions and carefully balanced.

The piston rings are concentric semi-steel rings of Van Blerck special design.

Connecting rods are of chrome nickel steel, tubular in section.

The crank shaft is made of chrome nickel steel, machined



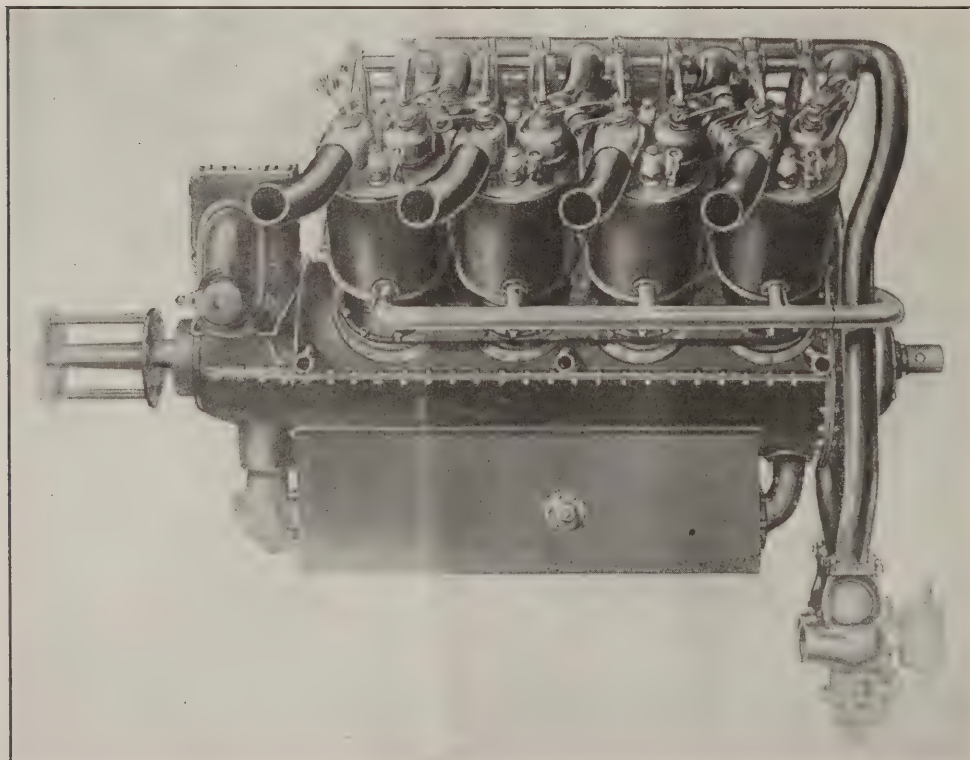
all over and balanced running. It is drilled for lightness, and effectively plugged for the force-feed lubrication system.

All bearings are of high-grade babbitt, and are easily replaced. The upper bearings in the crank case are interchangeable, and are of the bronze shell babbitt-lined type. The main bearing cap is poured with babbitt directly into the cap, and in renewing, a new cap should be used.

The cam shaft is of steel with cams forged integral with shaft, and case-hardened. Bearings are lubricated by force feed.

High-tension, two-spark magneto is used.

The intake manifold to carburetor is made of suitable cold-drawn material, smoothly finished on the inside.



The all-steel eight-cylinder Van Blerck motor which weighs  $3\frac{1}{4}$  pounds per horsepower.



# SCOUTING TRIP OVER THE CITY OF MEXICO

W. LEONARD BONNEY, the American aviator who is at present in Mexico City, is operating under war conditions and its attendant dangers. He recently took General Pabla Gonzales, who is probably next to Carranza in influence and importance, on a scouting trip over the city and into adjacent territory.

Mexico City has an altitude of 7,200 feet above the sea level, so that the aerial trip was made at a very considerable altitude above the former basic mark.

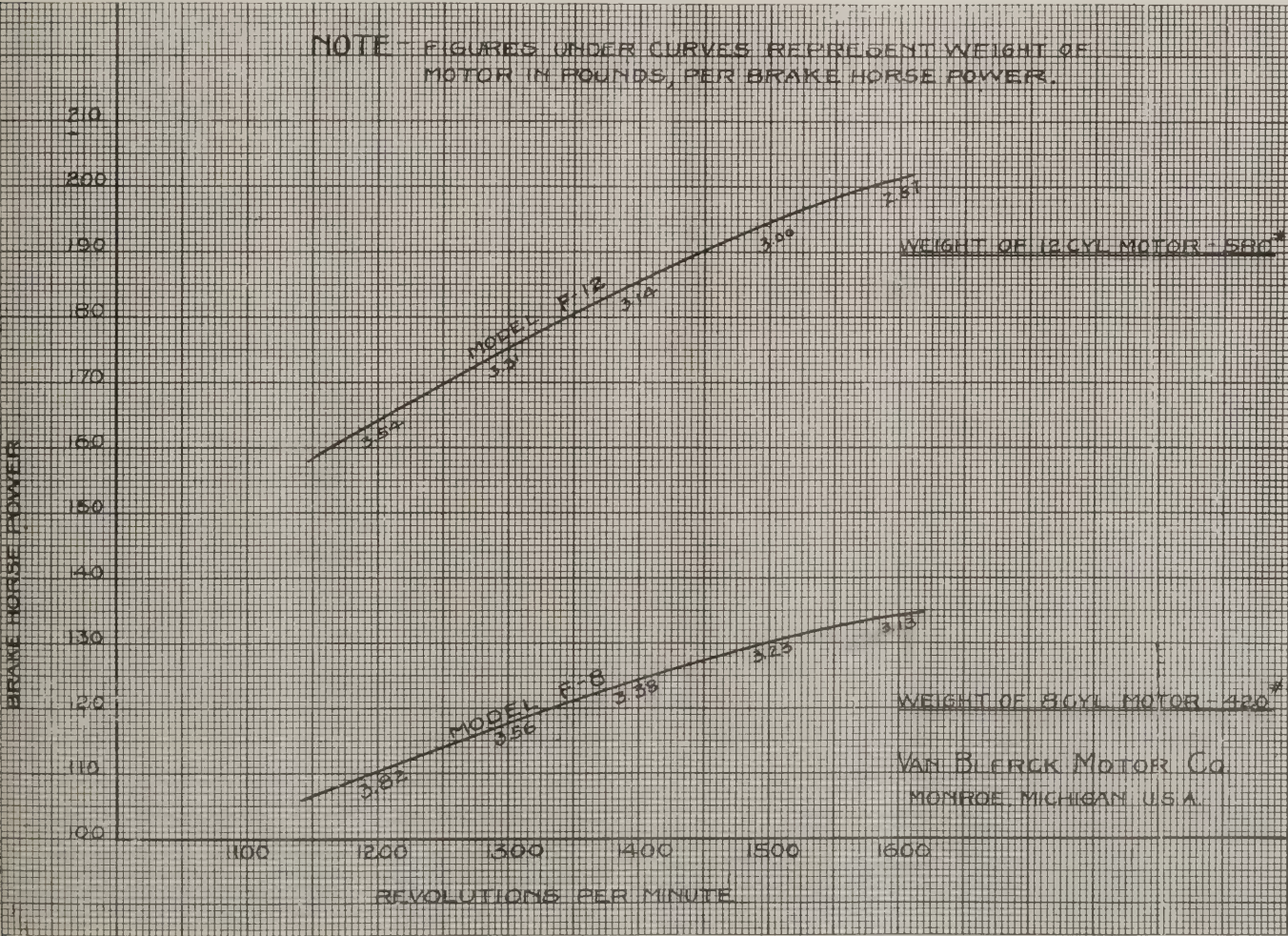
The trip was not without its military value, but as an event of popular interest it was important in the troubled capital of the Mexicans, and the newspapers of the city devoted large space to the event.

The voyage of 36 minutes was made in a Huntington biplane which is No. 2 of the Aerial Squadron of the Constitutional forces. Mr. Bonney first carried the General to Cuajimalpa. Then they reconnoitered a camp of Zapatistas. The weather conditions were ideal so that the General was able to obtain just the information that was desired. Upon the completion of the inspection of the enemy's forces and position Mr. Bonney and the General returned over the capital and made a safe landing.

"The Huntington Aeroplane," says Mr. Bonney, "is giving excellent satisfaction, and the officers of the government are well pleased with it."

Mrs. Bonney arrived in Mexico City early in the month for an indefinite stay, and she is delighted with the country.

Mr. Bonney writes his appreciation of Aerial Age, whose pages both entertain him and keep him abreast of progress in the aeronautical world.



Power curves of the Van Blerck motors.



## VARIOUS METHODS OF CONSTRUCTING STRUTS

THE shape of the various struts of an aeroplane are determined principally by aerodynamic considerations. As a good streamline section may be weaker laterally for a given weight than an inferior streamline form, the great effort is to shape and combine suitable materials so that a strut may be fashioned which shall have sufficient strength without adding to weight. In other words, the trend of mechanical ingenuity in this direction, as indeed in all pertaining to the aeroplane, is to perfect combinations which shall increase the strength while decreasing the weight.

Sketch No. 1 shows the simplest form of construction, where the strut is machined from a solid piece of wood, the kind selected being determined by the purpose to which the strut is to be put.

No. 2 sketch shows a strut that is formed from two pieces of wood glued together. The method generally employed is to saw the piece from which the strut is made lengthwise and then to turn one of the pieces around end to end. The effect produced is obvious, the reversing of the grain giving an added degree of strength.

The next step in the evolution of the strut is shown in Sketch No. 3 where the nose and the tail are made of ash and the center piece of spruce. In this there are three pieces in the strut, instead of two as in the preceding illustration.

But in No. 4 the number of pieces is increased to five, though there is no radical departure from the manner of assembling them. The nose piece, the center piece and the tail are of ash, while the remainder of the strut is made of spruce.

In the foregoing class the struts are necessarily heavy and in consequence they are employed principally where the member is subjected to a heavy load or a severe shock. Such struts are used in the undercarriage for inter-plane struts joined to the lower wing at the point where the chassis members are attached, or in machines where the undercarriage is secured to the lower wing instead of to the body.

In designing the lighter form of struts there are three courses—reduce the depth and thickness of the types just discussed, and of course the limit is soon reached in that direction, or to use larger sections and hollow them out, as nature does in a reed, or to employ metal in combination.

It will be seen that in the strut shown in No. 5 the formation is in two pieces. Two grooves are made in each portion of the strut, leaving the center untouched, and they are then joined together. The transverse web thus formed very materially strengthens the strut against lateral buckling.

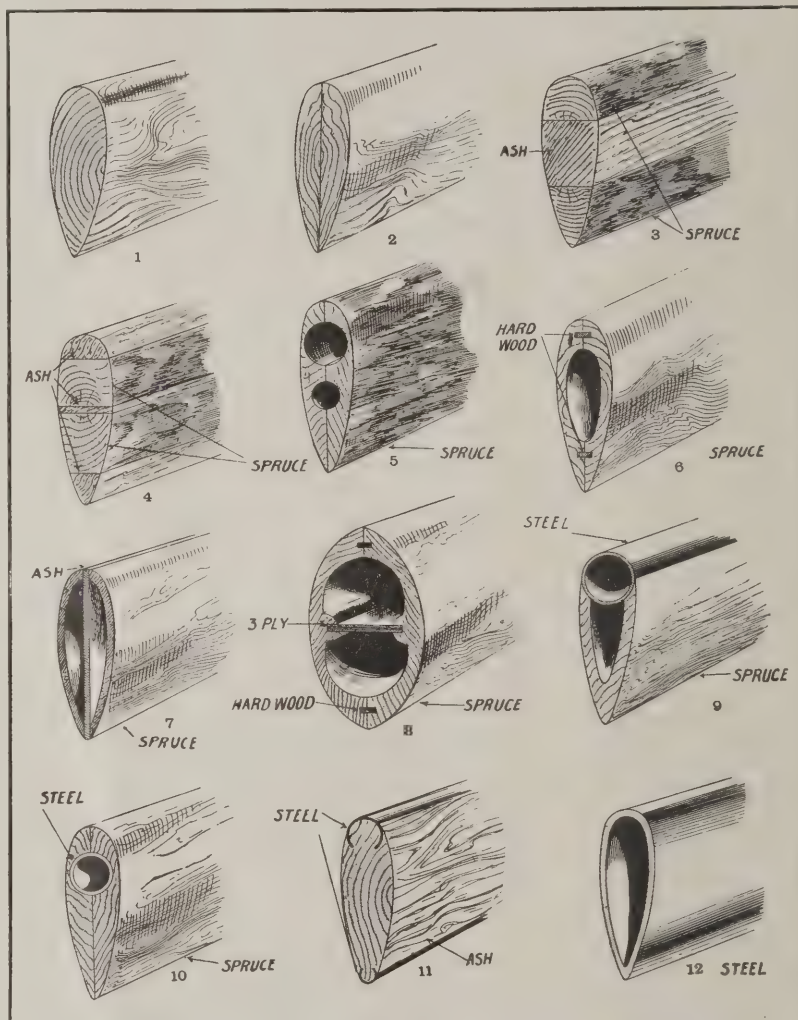
In No. 6 the two halves are joined together by means of a fillet of hard wood.

No. 7 is a longitudinal web of ash to which is joined two pieces of spruce.

The distinguishing feature of No. 8 is the transverse web formed by a strip of three-ply wood set into recesses in the

sides of the strut. In this strut, as in the other combination forms referred to, the pieces are glued together.

The final four illustrations are combinations of wood and metal. No. 9 is a steel tube to which is attached at intervals



How Streamline Struts are Built Up.

by means of bindings a fairing of wood. In the No. 10 illustration the steel tube is enclosed wholly within a strut of spruce roughly conforming to the simple form shown in No. 1, while in No. 11 the nose and the tail of the strut are formed by steel tubes, not quite closed on one side, and which are pushed into grooves in the wood.

When all-steel construction is used it generally takes the form of a cold drawn steel tube that may be either elliptical or in the form herewith shown in the final illustration.

(Continued from page 307)

T. H. Hunter, William Marback, Jr., T. J. Greer, S. K. Lacey, A. Orchard, A. W. White, R. W. Flippens, R. D. Reynolds, S. E. Green, F. L. General, T. L. Frickens, E. W. Shank, R. W. Max, R. Whiteseine, Steve Calloway, pilot; Arthur C. Burns, pilot, and Edward Olliver.

The sum of \$1,200 from the National Aeroplane Fund has been allowed to pay for the training of aviators for the California Militia.

### Arizona Aero Association Doing Good Work

Miss Katherine Stinson, whose work in arousing an interest in aeronautics among the high school students in Texas has attracted much attention, was recently asked

by the Arizona Aero Squadron Association, formed to assist in the National Aeroplane movement, to do something to arouse interest in Arizona in aviation. She immediately offered a gold medal to the pupil in the Tucson High School who would write the best essay on "The Value of the Aeroplane as a Factor in Preparedness." A second prize, a sum of money, was offered by the Aero Squadron Association, and the third, an admission pass offered by the Southern Arizona Fair Association. The winner of Miss Stinson's medal was Byron Ivancovich; the winner of the second prize was Gordon Sawyer. Miss Stinson was present at the ceremonies held in connection with the announcement of the winners and personally awarded the prize to Master Ivancovich. More than one hundred pupils competed for the prizes.





# FOREIGN NEWS



## BRITISH GUIANA

Residents of British Guiana have raised a fund with which to purchase a 100 h.p. Gnome-Vickers gun carrier for the Imperial Aircraft Flotilla.

## BULGARIA

Two British aeroplanes successfully attacked the railway station at Ferejik, not far from Enos, in Southern Bulgaria, near the Turkish border. One machine was damaged by the fire of the enemy, but the pilot managed to land safely in the marshes on the opposite side of the river, where he burned his machine. Meanwhile, the pilot of the second aeroplane, seeing his companion's mishap, landed beside him and succeeded in bringing him away just in time to escape capture by soldiers, who were running toward him.

## FRANCE

Four German aeroplanes which flew over Verdun and threw down some bombs were indirectly the cause of severe damage in their own territory, for as a retaliatory measure five French aeroplanes got under way and threw twenty shells on the railway station at Briulles, south of Stenay. The railway line was cut and a train which was making its way northward was obliged to turn back.

A French aeroplane was compelled to make a landing near Dampcevin on the left bank of the Meuse, before the positions of the enemy, where a severe artillery fire was at once directed toward it which, however, did little damage. Both aviators are safe.

A French aeroplane on November 28 threw down six shells on the barracks at Lens, seriously damaging the buildings.

Sergeant Georges Carpentier, champion heavyweight pugilist of Europe, now attached to the French aviation corps, has been decorated with the military cross for brilliant and daring reconnaissances in an aeroplane.

Carroll Winslow, of New York City, has been accepted for service in the French Army aviation corps. In a letter home he expresses his surprise over the conditions he found in the corps at Dijon. Many officers with whom he came in contact are former residents of New York, who dropped business at the call of the mother country and returned to the nag. In the training division there are men of all nationalities—French, English, Russian, Italian, Japanese, Chinese, South Americans and six Americans.

## GERMANY

A period of clear, frosty weather which lately prevailed has been taken advantage of by aviators and artillerymen along the entire front. North of St. Mihiel an enemy aeroplane was forced to land behind the German lines and it was destroyed by artillery fire.

In the Western theatre of war, one English and one French aeroplane were shot down and the occupants made prisoners on December 1.

Baron Cederstrom, a director of the Swedish government aeroplane factory, who has been visiting aviation centres in Germany, is authority for the statement that aeroplane construction in the latter empire is undergoing a complete revolution. Heavy machines are taking the place of light ones. The new machines are capable of carrying immense loads, including guns, wireless apparatus, petrol bombs and signaling devices.

Describing one such machine on which he made a trip, the Baron said it was a giant battle-biplane of improved designs and enormous dimensions, nearly three times the size of the ordinary albatross type, with immense lifting power, great stability and notable speed, and carrying an unprecedented weight of armor, artillery, petrol and provisions with a very large crew.

## GREAT BRITAIN

An analysis of casualty statistics kept in London reveals that people are safer indoors during Zeppelin raids than they are in the streets. In the attack on London on October 13, between 9 and 10 p. m., out of thirty-three persons killed and twenty-six injured, all but five were struck while they were in the open air.

Dispute over the effectiveness of the raid made on the Krupp works at Essen, Germany, by Allied airmen is, in a measure, cleared up by a single item appearing in the annual statement of the Krupps, published in a German paper. The line reads: "Claims and damages due to war, M. 10,000,000"—(\$2,375,000).

On the Western front there were no less than 15 aerial battles in one day during the latter part of the month. One British pilot at one time engaged in battle with five enemy airmen. One German machine was brought down near Ceguchin.

Bombing attacks were made recently against the German aerodrome at Gips and an ammunition factory at La Chapelette. Fourteen machines were attacked at the former place and nineteen at

the latter, and considerable damage was done in both instances.

Reports from the coast district state that German aeroplanes were active there on the 28th, dropping bombs. During the day a French aeroplane brought down a German aeroplane and a British seaplane brought down a German seaplane.

A scheme of insurance against air-raid and other risks has been provided for the poor by Parliament. Any person can now apply to the postoffice and obtain insurance on household goods up to the value of \$500. The insurance will not cover life, nor personal belongings, but does cover furniture and fixtures, tools of trade, etc. Not more than one certificate may be taken out on the same set of goods and if other insurance is carried application must first be made for redress to the insurance company. If there is then any remaining loss to be covered that remainder will come out of the insurance provided by the government.

## INDIA

A fund started for the benefit of the Imperial Aircraft Flotilla by the *Times of Ceylon* has thus far produced three machines. The last machine is a 100 h.p. Gnome-Vickers gun carrier, to be known as the "Night-jar from Ceylon." The two others will be called "Paddy from Ceylon" and "The Devil Bird from Ceylon."

## ITALY

One aeroplane was brought down by our anti-aircraft guns in the Milegna zone on the plateau northwest of the Arsiero, on November 20. The pilot and observer were found dead. One of our air squadrons flew over the enemy's aviation camp at Assevizza, throwing more than one hundred bombs and causing important damage. The aviators returned safely.

Another squadron of aeroplanes dropped bombs on Verona and Vicenza, in the Italian Province of Venetia, and on Grado.

Count Persico, a nephew of Pope Benedict, had a narrow escape during the recent raid by Austrian aeroplanes on Brescia. One of the missiles dropped by the aviators fell within a few yards of where he was standing.

## RUSSIA

Petrograd dispatches describe a unique method of administering poisonous gas to the inmates of a fortress. Balloons slightly larger than the toy balloons with which children play are used. A small bottom compartment is filled with the heavy poisonous gas. The remainder of the balloon is inflated with illuminating gas and they are liberated in a wind which will carry them over the point of attack. Then when they are floating over the fortress sharpshooters puncture them with rifle bullets, the shot completely destroying the little bag. As the poisonous gas is heavier than air it drops into the fortress while the gas used to float the balloons rises. This method, the dispatches say, was used in the attack on the fortress at Ossowetz, where during two days, it is asserted, 1800 of these balloons were floated over the ramparts.

An official Russian publication gives testimony in the form of a historical document to the effect that Count Zeppelin has been anticipated in the conception of the Zeppelin dirigible. The document is a confidential message delivered to the Emperor Alexander I. in April, 1812, by the Counsellor Schroder, who, when Napoleon was preparing to invade Russia, arrived at St. Petersburg and had a private audience with the Emperor. The message came from an attaché of Count Roumiantsoff, the Chancellor, named David Maximowitch Alopeus.

The message tells of the invention of a dirigible balloon capable of destroying an army or a fortress by means of bombs, and it contains this paragraph: "The inventor, whose name is Leppich, and who has been a captain in the British Army, is an excellent mechanic; he has succeeded in constructing a flying machine with which he has made a distance of forty-five leagues with and against the wind, rising and descending at will. Unfortunately the news of this invention has come to the King of Wurtemberg, the ally of Napoleon; and one of his Ministers, who possesses in the highest degree the confidence of the King, has become intimate with the inventor; this minister whom I cannot name, knows all the details of the invention and has advanced money to the inventor."

## SWEDEN.

Dr. Erik Mjoeberg, in an address at a meeting of the Swedish Anthropological and Geographical Society in Stockholm, described plans he had made for an expedition to explore by means of aeroplanes the unknown regions of the island of New Guinea.

## SOUTH AFRICA

The women of Johannesburg have raised a fund with which they have purchased two 70 h.p. biplanes for the Imperial Aircraft Flotilla.



Prisoners of war on the march in France as seen from an aeroplane.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

### THE AERO SCIENCE CLUB OF AMERICA

29 West 39th Street New York City  
PACIFIC NORTHWEST MODEL AERO CLUB  
915 Ravenna Boulevard, Seattle, Wash.  
LONG ISLAND MODEL AERO CLUB  
401 Grant Avenue, Cypress Hills, L. I.  
BAY RIDGE MODEL CLUB  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

### DETROIT AERO RESEARCH AND MODEL CLUB

c/o William P. Dean, 1717 Concord St., Detroit, Mich.

### BUFFALO MODEL AERO CLUB

c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.

### THE ILLINOIS MODEL AERO CLUB

Room 130, Auditorium Hotel, Chicago, Ill.  
TEXAS MODEL AERO CLUB  
517 Navarro Street, San Antonio, Texas

### SPRINGFIELD MODEL AERO CLUB

Springfield, Mass.

### MILWAUKEE MODEL AERO CLUB

455 Murray Ave., Milwaukee, Wis.

### CONCORD MODEL AERO CLUB

c/o Edward P. Warner, Concord, Mass.

### PLATTSBURG MODEL AERO CLUB

c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.

### MODEL AERO CLUB OF OXFORD

Oxford, Pa.

### Aero Science Club of America

At the last meeting the club had the pleasure of hearing Mr. Tismer of the Aeronautical Society speak on the subject of improving the present day model aeroplane to be of value in warfare. Among other things he said that models could be improved upon to the extent that they could be used in war for the purpose of dropping bombs in the event of close range fighting. By sketches the speaker showed how, with the use of gears the model could be controlled after it had started on its mission. The system of control he said could be in the form of gears operated by a worm gear, which gear could be attached to the propeller shaft. The rudder swings either right or left in accordance with the revolution of the gears. The course of the model is predetermined by the arrangement of the gears which operate the rudder at different times. The lecture was most interesting and highly appreciated by those present.

The club is arranging to hold lectures during the winter one lecture to be delivered at each meeting. At the coming meeting Mr. Lawrence W. Lesh will deliver a lecture on "Wireless for Aeroplanes." Mr. Lesh spoke at a past meeting about his experiences with gliders. At the meeting of January 1st Mr. Louis A. Fenouillet, who has had considerable experience with gliders will lecture on the subject of gliders. Other lectures will be arranged for at subsequent meetings.

During the week of November 29, Messrs. Meyers, King and Cavanagh, representing the club, gave instructions to the members of the Elmwood School Model Aero Club, Orange, N. J., as to the construction of models. The club will cooperate with the Elmwood School M. A. C. until the members of that club are proficient in the constructing and flying of Model aeroplanes. On Thursday evening, December 9, Mr. C. W. Meyers will give further instructions at the E. S. M. A. C.

The affiliation of the following clubs was announced at the last meeting:

The Springfield Model Aero Club, Springfield, Mass; The Denver Model Aero Club, Denver, Colo., Mr. R. H. Pearson, director.

The Buffalo M. A. C. branch of the Aero Science Club announced its intention of changing its name from the Buffalo Model Aero Club to the Buffalo Aero Science Club. This was approved by the executive committee of the club.

### Illinois Model Aero Club

BY WARD PEASE.

We have received notice from the Aero Club of America that we have been awarded the Villard trophy, which was to go to the model club having the highest average in the three contests of the National Model Aeroplane Competition. This marks the end of a long season of hard work on the part of the members of the club, and especially on the part of Hittle, Pease, Cook, Nealy, Hitt, Hall, Schweitzer, Lucas and Lathrop, who represented us on the various teams in the different contests. The cup is coming to Chicago, and we hope that through our future efforts it shall remain here.

The Illinois Model Club wants to thank Mr. Villard for offering the trophy and the Aero Club of America for originating and carrying out the National Model Aeroplane Competition in which the cup and the prize money were competed for. We also wish to thank Mr. Stevens, who was judge in our contests, and Mr. Dickinson for providing a place where we might hold our hydro meets.

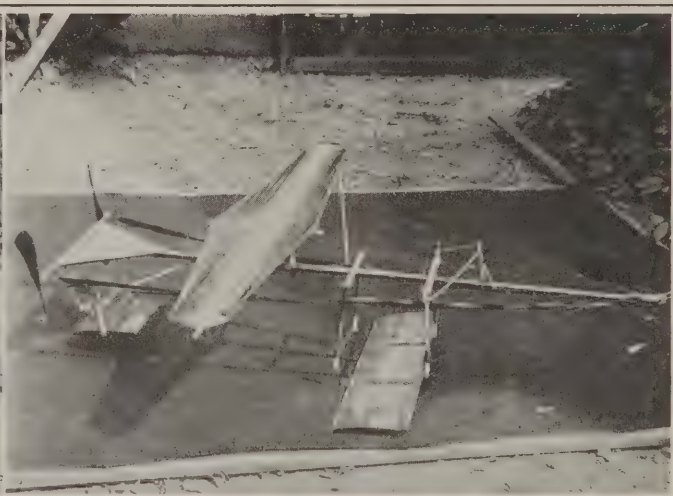
Already we have been considering plans for next year's contest, and we are wondering what kind of models the meets will call for.

The first of our series of winter meets will be held in a week or two, and as soon as a suitable collection of indoor fliers and exhibition models can be got together, our chairman of the membership committee will arrange with Mr. Shoop, superintendent of schools, for meets to be held in the high schools to get the boys interested in model aerobatics.

### Elmwood School Model Aero Club

BY GRIFFITH BURR.

On Thursday, December 2, the club held its second meeting. Messrs. Meyers King and Cavanagh of the Aero Science Club were present and gave practical demonstrations in the construction of Model Aeroplanes. Many members were present and all were enthusiastic over the results of the meeting. Through the courtesy of Mr. Smith, principal of the school, the club was permitted to use the manual training room for the purpose of making models. A great deal was accomplished at this meeting and the indications are that the members will soon be building satisfactory models.



The models shown in the accompanying photographs, one a compressed air motored model and the other a model hydroaeroplane, were constructed and flown by V. E. Johnson, M.A., editor Model News Column, "Flight."









## The SPERRY

### Air Drift Indicator

Tells the pilot when he is correctly banked. Its purpose is to supply to the tractor machine what the pennant supplies to the pusher type, but it is independent of the air stream for its operation. It can be conveniently located inside the cowl, alongside other instruments, where it can be electrically illuminated, or we can provide it with a radium card so that it can be read without electrical illumination.

*Write for Full Particulars*

## The Sperry Gyroscope Company

126 Nassau Street

BROOKLYN, N. Y.

#### Thomas News

The past week has witnessed much flying over Cayuga Lake and the surrounding territory. Two of the school machines have been constantly in the air. The new pusher hydroaeroplane, built for the school, has been completed, and is undergoing the finishing touches.

Since Thanksgiving Day, William S. Brock has made many flights with the second Navy seaplane. During these flights the machine behaved admirably, showing many good qualities obtained by recent improvements made to this type. An unfortunate accident, however, on the eve of its acceptance trials, resulted in the complete demolition of the aeroplane. After making an extended practice flight, carrying the full load (including passenger, four hours' fuel and useful load), while descending from an altitude of 2,000 feet the machine came down with such speed and at so steep an angle that the pilot was unable to gain complete control in time to save the machine from plunging into the lake. Both passenger and pilot were immediately rescued from the wreck entirely unhurt and suffering only from shock.

The next of these seaplanes is being rapidly pushed to completion, and it is expected that it will undergo its acceptance tests within two weeks.

#### Sturtevant News

An order for two 140 h.p. eight-cylinder aeronautical motors to be used for training purposes in connection with the National Defense Movement has been placed with the B. F. Sturtevant Co., of Hyde Park, Mass. These engines, which are of the four-cycle, water-cooled "V" type, will go into military aeroplanes constructed by the Burgess Company, of Marblehead, and upon completion will be shipped to the U. S. Naval Aeronautic Station at Pensacola, Fla.

The Sturtevant Company have reason to be proud of the castings which enter into the construction of their aeronautical motors. These castings are all made at the works. An expert aeronautical motor designer and engineer during a recent tour of inspection through the Sturtevant plant, declared that the cylinder and base castings of the 140 h.p. motor were the most perfect and beautiful that he had ever seen during his travels, both here and abroad.

A communication was recently received from Major Hume, of the English R. F. C., recommending highly the Sturtevant "eight" 140 h.p. motor.

#### Carlstrom Puzzled Customs Officials

When Victor Carlstrom flew from Toronto, Canada, to New York City and landed across the river in New Jersey, he unwittingly made a lot of trouble for the custom officials of the port of New York in that he brought to the surface a brand new kind of a tariff problem.

The trouble began when George F. Doherty, of the brokerage firm of M. L. Eckstein & Co., 21 State street, informed Collector Malone that he wished to make an "entry" for the machine Mr. Carlstrom flew. This would have been a simple matter if the aeroplane had been entered as merchandise, or for exhibition purpose, but the experts said that there was no precedent for a case like Carlstrom's and they were at a loss what to do. Had the machine been entered as merchandise it would have been subject to an ad valorem duty of 20 per cent.

On the advice of the collector's solicitor, the aeroplane was finally entered on the form provided for the masters of seagoing vessels, and as this was an American-made machine, it was held that it was not subject to duty. This ruling is, of course, subject to the review of the Treasury Department, establishes a precedent for aviators who cross the frontiers in American-made machines. They must hold themselves to that set of Federal rules which applies to the masters of vessels entering the port from another country.

But after that phase of the matter had been settled it transpired that Mr. Carlstrom had failed to make a baggage declaration upon his arriving in New York, as he is required to do under the tariff regulations. He was summoned to the Custom House where he said that he brought no trunks or other merchandise, that his entire luggage was restricted to a new suit of clothing. As an exemption of \$100 is allowed for a traveler's personal belongings, he finally escaped without any taxation.

While the incident has its humorous side, aviation is pretty sure to develop new and perplexing duties for the collectors of customs as the number of machines increase and international flying becomes a matter of every-day business.



C. DOUGLAS WARDROP

Managing Editor

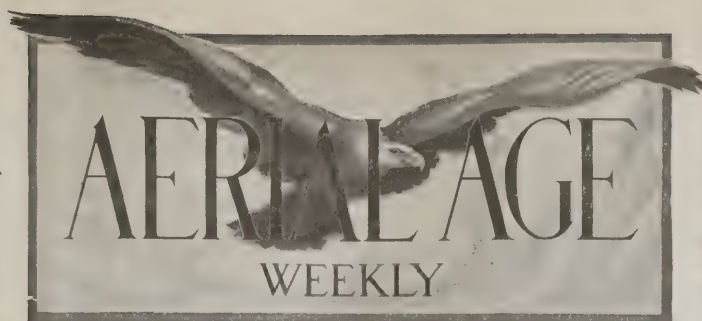
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VOL. II

NEW YORK, December 20, 1915

No. 14

## Naval Programme Aims to Make U. S. Tenth Among World Powers

THE following letter, pointing out the utter inadequacy of the Naval Program submitted by Secretary Daniels from the standpoint of aeronautics, since it does not provide for the placing of our Navy even as high as tenth in rank among nations, has been sent to Congressman L. P. Padgett, Chairman of the Committee on Naval Affairs, House of Representatives, and Senator Benjamin R. Tillman, Chairman of the Committee on Naval Affairs of the United States Senate:

The Honorable Benjamin R. Tillman, Chairman,  
Committee on Naval Affairs,  
The United States Senate,  
Washington, D. C.

My dear Mr. Tillman:

We have carefully read the Naval Program for the ensuing five years as outlined by Mr. Josephus Daniels, the Secretary of the Navy, and after due deliberation we respectfully submit for your consideration the following points regarding the apparent inadequacy of the program:

1. It is stated that it is planned to provide "a well proportioned Navy," but it is not stated what rank our Navy will have in comparison with the Navies of the world, and whereas the provision for aeronautics is barely sufficient to make our Navy tenth, placing this country behind all the first and second class powers, we are alarmed and concerned, because if this inadequacy covers other branches of the Navy besides aeronautics, the plan as a whole is utterly insufficient and should be materially extended and increased.

2. The program allows only \$2,000,000 for aeronautics for next year, which will barely be sufficient to acquire, maintain and operate seventy-five aeroplanes for the year. For the following four years there is allowed only \$1,000,000 a year, which will not even be sufficient to replace wornout aeroplanes and operate the seventy-five machines to be acquired during the first year of the program.

3. To allow only seventy-five aeroplanes for the Navy, our first line of defense, in these days when aircraft are deciding factors, and the nations of the world are requiring aeroplanes by the thousand, appears to us to be extreme lack of due consideration to this very important branch.

4. The Country's demand upon the Administration is for a Navy equal to the best, and whereas the first line of defense of the first and second class powers includes thousands of aeroplanes, it follows that seventy-five aeroplanes is only one-tenth of what we should provide immediately.

5. The potentiality of aircraft is increasing in rapid strides and, as Sir John French has stated, the extent of their use in war is practically unlimited. Already seaplanes, besides being the eyes of the fleets, are becoming potential instruments for submarine warfare, for attacking merchant ships, and for patrolling the seas as far as three hundred miles from the coasts. Fights between aeroplanes are becoming more numerous, and the war is rapidly being carried into the air.

6. We submit, therefore, that if the Naval Program is adequate in every other way, greater consideration must be given to aeronautics in the reshaping of the program by

the Naval Committee of the House of Representatives. If every branch of the Navy has received the treatment in the program that aeronautics has received, we urge that it be rejected and a program be substituted which will make our Navy equal to the best.

7. In the program Congress is urged to increase the appropriation for the Naval Militia, so as to supply aeroplanes for training officers of that organization, but no specific recommendation of what is needed is made. If the Navy, for any reason, can not be given more than seventy-five aeroplanes, then the Naval Militia of the 23 states having such organizations must be supplied with the aeronautical equipment necessary to form a substantial reserve. Each of the states having Naval Militia or Naval Reserve organizations has between two and four battalions. Four aeroplanes and the necessary parts and equipment should be provided to each battalion.

In conclusion, I beg to assure you of the hearty co-operation of the Aero Club of America and its 27 affiliated Aero Clubs in any way in which these organizations may be able to assist in securing for this country a Navy equal to the best.

Very sincerely yours,

(Signed)

ALAN R. HAWLEY,  
President, Aero Club of America.

### The Aeroplane Battleship

AERONAUTIC authorities are enthusiastic over the announcement that there is already in course of construction at the Curtiss factories parts for the "aeroplane battleship" because they foresee that it will mean a wonderful advance in all branches of the industry.

"Mr. Curtiss' giant triplane means much to our neglected defenses, as well as to aviation from sporting and utilitarian standpoints," said Alan R. Hawley, president of the Aero Club of America. "Our navy, which has only a dozen small flying boats and hydro-aeroplanes—when it should have at least 1,000—needs large seaplanes to counteract our lack of ships of the "scout" type, as well as for the protection of the battleships and coast shipping, from submarines.

"In these times when aeroplanes are deciding factors in the war, and the warring nations who had and who are now acquiring thousands of aeroplanes are complaining of their inability to get them in sufficient number, it is amazing and disgusting to find that the naval program published recently provides for the acquisition of only seventy-five aeroplanes for scouting purposes between now and June 30, 1917. As though that were not small enough, it is provided that in the four years to follow there shall be only \$1,000,000 a year spent on the air service. Germany three years ago allowed \$35,000,000 for aeronautics.

**America Must be Given a Navy Equal to the Best.** If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.



"The example set by Mr. Curtiss is being followed by other aeroplane constructors, and our Navy could, by prompt and energetic action, acquire a substantial fleet of giant air dreadnaughts. It is to be hoped that Congress will act in this matter.

"Mr. Curtiss' new triplane surely will be able to cross the Atlantic in a single flight, and I hope that the flight will be made soon."

Henry Woodhouse, Governor of the Aero Club, said:

"Mr. Curtiss' dreadnaught of the air brings a new factor and a most potential one in naval warfare—potential against battleships as well as against submarines.

"The America, which was the first flying boat with fighting qualities, demonstrated its value as a kingfisher, as it were, against submarines. It and the scores of other sister air cruisers have proven themselves the most effective enemies of submarines. The original America is credited with the destruction of three submarines. The new Curtiss dreadnaught of the air will make it possible to launch full sized torpedoes from the air.

"The large aeroplane, with its great weight and powerful motors, can go through the fiercest storms—storms that would compel the average ship to stay in port. The great speed enables the aeroplane to go through the storm zone quickly, whereas the average ship must, because of its low speed, remain helpless in the storm zone.

"While we must consider this development first for its military value, its greatest value will be demonstrated after the war, when these 'liners of the air' are used for general purposes. The sky has no frontiers and none can be built there."

Henry A. Wise Wood, president of the American Society of Aeronautic Engineers, vice-president of the Aero Club of America and a member of the Naval Consulting Board, said:

"This new development is most significant in that it proves that there is no limit to the size of future aeroplanes. Before the America was built we were told that it was a mechanical impossibility to build an aeroplane larger than the aeroplanes of that day, particularly flying boats. Mr. Curtiss proved that it could be done—and he will undoubtedly prove again that a dreadnaught of the air can be built.

"It is fitting that Mr. Curtiss, who developed the first hydro-aeroplane and made the first flight from the water, and who later developed the flying boat and then the America, should now evolve a 'dreadnaught of the air.' This aeroplane which Mr. Curtiss has evolved goes beyond the expectations of the wildest enthusiasts of a few years ago. We have thought for the last ten years that some day aeroplanes would become practical, but could not anticipate such progress in less than twenty years."

#### Twenty-Four States Anxious to Organize Aviation Corps

Twenty-four states are anxious to organize aviation detachments in the National Guard and Naval Militia, and are applying to the Aero Club of America for assistance in getting aeroplanes and equipment. In most cases the Militia authorities had been trying for a long time to get aeroplanes, but had been unable to provide same on account of the lack of funds and inability to get aeroplanes from either the War or Navy Department. The fact that the Aero Club of America has succeeded, with the National Aeroplane Fund, in supplying aeroplanes to the National Guard and Naval Militia of New York state, has fostered the movement which resulted in raising \$20,000 for the aviation section of the Militia of Rhode Island; has presented a flying boat to the Militia of Wisconsin and has given \$7,000 for the training of Militia officers of the states of New York, Massachusetts, California, Arizona and Texas in aviation, has created new hopes, and the Militia authorities are applying to the Aero Club of America for aeroplanes and assistance.

The Governors of the Aero Club of America in reply to these applications have extended their hearty co-operation and will make every effort to secure aeroplanes for them. To induce people in each state to subscribe to a fund to be used for acquiring aeroplanes the Governors of the Club have advised the Adjutant Generals that they will add 10 per cent. to any sum up to \$10,000 raised by any responsible organization before February 1, 1915.

The Aero Club of America is able to do this through the generosity of Mr. Emerson McMillin, the New York Banker, who has offered to add \$100 to every \$900 raised by the National Aeroplane Fund, up to the sum of \$500,000.

The Aero Club of America is inviting contributions to the National Aeroplane Fund to meet these needs. Checks should be made payable to The National Aeroplane Fund, and sent to 297 Madison Avenue, New York City.

Herewith are given some of the letters received from

heads of the Militia of different states, asking for assistance, and reports of the latest developments of the aviation sections of states which are already organizing aviation sections:

#### Ten Officers of Ohio Guard Ready To Take Up Aviation

The State of Ohio, the home of the Wright brothers, has been anxious to organize an aviation section of the National Guard, but lack of funds has prevented any material progress.

The following letter from Colonel R. L. Hubler, First Ohio Infantry, to Dr. John C. Eberhard, representative of the Aero Club of America in Dayton, gives the latest development:

"My Dear Doctor:

"Replying to your very kind letter of the 13th inst., I have taken up this matter with my officers. I find that they are all very much interested in the matter of training officers of the National Guard in Military Aeronautics, and the following officers of the First Ohio Infantry have indicated their desire to take the course of training providing the expense is borne by the War Department as outlined in Bulletin No. 46 of the War Department:

"Major W. H. Meyers, Major J. D. Crawfis, Captain Wm. H. Parker, Captain I. H. Dube, Captain W. T. Rossell, Jr., Lieutenant F. R. Miller, Lieutenant Clinton Wunder, Lieutenant S. A. Spencer, Lieutenant Thomas Morrow, Lieutenant Burton Robinson.

"In case it is decided to establish aviation schools elsewhere than at San Diego I suggest that you could not find a better place than Camp Proctor, Ohio, which we shall tender to the Aero Club and the War Department for that purpose. We have a drill field about twenty-six acres in size, which would make a beautiful landing place, and in addition our camp is but 200 yards from the Ohio River, so that work with hydroplanes could be done there nicely also. We would expect the War Department to pay for the hangars, etc., but in view of the instruction work given the officers of our regiment, we would charge no rental for the use of our field, etc.

"In case the expense of this movement is to be borne wholly or in part by voluntary contributions, I believe that the people of Cincinnati would do their share.

(Signed) "Yours very truly," "R. L. HUBLER,  
"Colonial First Ohio Infantry."

#### New Jersey Naval Reserve Anxious To Form Aviation Section Wants Aeroplane

The New Jersey Naval Reserve, like the New Jersey land Militia, is anxious to form an aviation section and Commander Peters has written the following letter to the Aero Club of America inviting the club's co-operation:

NATIONAL GUARD OF NEW JERSEY,  
Headquarters First Battalion Naval Reserve, U. S. S. Adams.  
Gentlemen:

It is desired to bring to the attention of the Aero Club of America the fact that the First Battalion, Naval Reserve of New Jersey, is organizing an aviation section.

This has received the approval of the Navy Department, and I have appointed Ensign-elect J. Homer Stover to the immediate charge of organizing the section.

The Division of Naval Militia Affairs of the Navy Department has been requested to state what aeronautic equipment the Government would supply for this section.

It has replied that clothing and equipment for the enlisted men in accordance with the funds available would be furnished.

In regard to furnishing an aeroplane or other special equipment it is advised that "steps will be taken to render such assistance as may be possible with the Federal funds available."

There is, however, no definite assurance that an aeroplane, hangar, etc., will be provided before some remote date from that source.

Knowing the aid that the Aero Club of America, with the assistance of the Aeroplane Fund, is giving in the promotion of military aeronautics, it is asked what assistance, if any, and in what form the Aero Club of America will give this organization in its work of obtaining an aeroplane and other necessary equipment for the aeronautic section.

Very respectfully  
(Signed) "EDWARD McC. PETERS,  
Commander, N. R. N. J.

(Continued on page 331)



# THE NEWS OF THE WEEK

## Postmaster General Recommends Aerial Routes

Postmaster General Burleson in his annual report has included in the estimates of expense for the fiscal year of 1917 the sum of \$50,000 for the establishment of aerial postal routes. A list of such routes has been compiled by the Department—places where great saving of time can be effected by sending mail by aeroplane instead of sending it by the circuitous routes over railways and highways.

In recommending this advance in the dispatch of the mails the report says:

"Postal needs will be served and the science of aviation encouraged by the establishment of an aerial mail service. From time to time experimental tests of the aeroplane as a carrier of the mails have been authorized, necessarily without cost to the department. During the fiscal year 1914 permission was given in four instances for the carriage of mails by this means, whereas application was made and permission granted in eight instances during the fiscal year 1915.

"There are sections of the country where this class of service could be advantageously employed, and therefore the estimates for the fiscal year 1917 include an item of \$50,000 to defray the cost of an experimental aerial postal service. This will give a much needed impetus to the development in this country of this very important means of communication. The department has compiled a list of routes on which aerial mail service could be established to material advantage."

## Thaw, Prince and Cowdin Coming Home

The rule of the French army allows all "permissionaries" to spend the full period of a leave of absence at home. William Thaw, Norman Prince and Elliott Cowdin, the American aviators who are serving with the French army, obtained an eight days' leave of absence without great difficulty, but when they coolly informed the authorities that their homes were in America, and that it was there that the vacations were to be spent, there was a ripple of surprise. As the rules of the army permit of no compromise, eight days were added for the voyage to America and a similar period for the return trip. The three men sailed last Saturday for New York and will report to the French consul as soon as they land. Then they will be required to take the first ship back to France that sails after the expiration of the eight-day leave.

## Lieut. Saufley Breaks Own Record

Lieut. R. C. Saufley, U. S. N., broke his own hydro-aeroplane altitude record at Pensacola, Fla. on December 3d by ascending in one hour to a height of 12,050 feet, in a Curtiss Model AH-15 hydro-aeroplane equipped with a Curtiss Model "OX" 90 h.p. motor.

Lieut. Saufley established an altitude record for hydro-aeroplanes on November 29th by climbing 11,616 feet in one hour with a Curtiss machine.

## Wright Company's Winter School in the South

Two representatives of the Wright Company have been in the South for some time looking for a suitable place to establish a winter training school. The main requirements consist of a plot of level ground of from 200 to 400 acres, located close to the water and convenient to good railroad facilities. Philip Boyer, representing the company, was in Tampa, Fla., not long ago and was favorably impressed with the advantages of that place.

Mr. Miller, the city manager of St. Augustine, went to Dayton, Ohio, some time ago and presented to the officers of the Wright Company the claims of St. Augustine for recognition. Upon his return to Florida, the Chamber of Commerce took the matter up in earnest and sent a telegram to Dayton offering strong inducements to the company if it would establish its school in the historical old town on the coast.

In Tampa, Mr. Boyer stated that the school would enroll probably 1,000 pupils before June 1, most of them being Canadians, who will be trained with especial regard to service as military aviators. The school at Dayton is to be abandoned, and in addition to the one to be established in the South there will be a school at Hempstead Plains, New York, near the Sheepshead Bay Speedway.

Seven or eight instructors will be attached to each school. Among those already under contract to the Wright Company are Walter Brookins and Howard Rinehardt. Seven or eight aeroplanes and two hydroplanes will be sent to the Southern school, and Mr. Boyer stated that these would be shipped within the next ten days.

In company with B. L. Hamner, secretary of the Board of Trade, Mr. Boyer visited several sites near Tampa and Port Tampa. He also inspected sites at Sarasota and Palm Beach.

## Subscriptions to the National Aeroplane Fund

The following additional subscriptions have been received to the National Aeroplane Fund, being raised by the Aero Club of America: Edwin B. Sheldon, \$250; Mr. and Mrs. John Markle, \$250; Gerald L. Hoyt, \$100; Mrs. S. N. Hinckley, \$100; Mrs. Gardiner Sherman, \$100; Mrs. Sidney Webster, \$100; Mrs. Harriet I. Backus, \$50; Franklin H. Gregory, \$50; William J. Riker, \$50; George P. Block, \$50; W. R. Peters, \$25; Wm. D. N. Perine, \$25; John C. King, \$20; Miss Marion Scofield, \$20; Albertus A. Reilly, \$10; Ambrose A. Reilly, \$10; Henry Kelly Brent, \$10; S. W. Childs, \$10; Duncan Candler, \$10; Dr. and Mrs. A. Vander Veer, Jr., \$10; George D. Barron, \$10; Irving H. Chase, \$10; Dr. James C. Ayer, \$10; Heth Lorton, \$10; Miss Dorothy Salisbury, \$5; Donald Campbell, \$5; Franklin W. Moulton, \$5; Wm. V. C. Ruxton, \$5; Charles P. Cowles, \$5; Eugene J. Koop, \$5; "A Woman," \$2; Emerson McMillin, \$148.

Type "H" Sloane Military Tractor, built by the Aircraft Co. This machine has a spread of 40 feet, a chord of 6 feet, 6 inches, and a gap of 6 feet, 6 inches, and is 26 feet overall.







John G. Gilpatrick looping in the Curtiss tractor at Toronto, Canada.

#### Sloane Tractor Has Successful Tests

That the new Sloane-Day tractor biplane has successfully passed the tests made by the British authorities at Hendon was announced in the New York *Herald* Sunday.

Charles Day, who designed the machine, which was built by the Sloane Aeroplane Company, of which Mr. John E. Sloane is the head, left here for England several weeks ago to try out the machine for the British government.

In the trials at Hendon, the machine attained a speed of eighty-four miles an hour. The machine demonstrated remarkable climbing ability, ascending at the rate of 375 feet a minute. The British authorities were much pleased with the work of the Sloane machine, as in other respects than speed it was of the much desired type—a suitable machine for scout work. In the eyes of the testers the machine ranked closely with the best English aeroplanes as a formidable opponent for the German taubes.

The Sloane-Day machine has a weight of about 1,790 pounds. It is capable of carrying two passengers in addition to the pilot. It carries armor which makes it bullet proof at the altitude of 1,600 feet and which protects the vital part of the machine and its passengers. It carries sufficient gasoline to take the car four or five hours at a speed of eighty-four miles an hour.

For landing on rough ground, a thing demanded frequently

in military aeroplanes, the machine has three wheels. There is a wing spread of thirty-six feet and the two planes have a surface of 400 square feet. There are five and one-half feet between the planes and they are set so that the upper plane is slightly in advance of the lower. A windshield on streamlines protects the occupants of the aeroplane.

#### Pensacola Has a Second Inquiry

In addition to the negotiations which the Chamber of Commerce of Pensacola has been carrying on with the Wright Co. for the location of a winter flying school in that place, the Chamber announces that it has also received an inquiry from another company which desires to locate there. The name of the company is withheld, but the Chamber says that a waterfront base, as well as an inland field, is required for the establishment of a factory to build aeroplanes and flying boats.

#### Domenjoz Makes Flights at Goshen, N. Y.

John Domenjoz, the Swiss aviator, made three sensational flights at Goshen, N. Y., on Dec. 11, for the benefit of a tag day committee working in behalf of the Goshen Hospital. On each of the trips he looped-the-loop a number of times and on the final trip he volplaned for a distance of approximately a mile and a half. His exhibition was backed by Mr. Grant Hugh Browne of 115 Broadway, New York City, who for many years has been identified with army contracting.

#### The Stinson School of Aviation

Joseph Gorman and Herbert MacKenzie made test flights at the Stinson School of Aviation, San Antonio, Tex., early in the month. They were accompanied by Lieut. Rader and Lieut. Bowen as official observers, upon whose report the applications of the students for licenses to fly will depend. The Stinson school has eleven pupils and others are en route.

Mr. Gorman, who completed his course of instruction with the flight referred to in the foregoing, is sporting editor of the Montreal Canada, *Evening News*.

#### Society Girls Take Up Flying in Oakland

Society girls in Oakland, Cal., have taken up aviation as a pastime. Among the devotees are Miss Helen Gray, Miss Barbara Miller and Miss Helen Audeffred, who are frequently seen skimming over the plains of Alameda in Silas Christoffer-son's biplane.

"I never realized how much I have missed in not earlier learning to aviate," said Miss Audeffred. "The sensation of flying is not only exhilarating, but there's a subtle thing about it that makes one feel something above a mere human being. It stimulates the spirit and aspiration as nothing I have ever experienced. There's no way of describing it except to say that it is glorious and wonderful. Of course it's dangerous, but one never thinks of that."

#### Sturtevant News

Impressed with the lack of facilities in the Aviation Corps of the U. S. Army and because the lack of machines is so marked, six Harvard alumni have taken upon themselves the task of equipping two aeroplanes in order that they may learn the principles of aviation with a view to being prepared to go into actual military service with their aircraft in case of war. Two Sturtevant Model 5 V type 140 h.p. motors have been selected for installation in their machines. This type of motor is being used by the U. S. Government and by the British Admiralty. The aeroplanes will be of the well-known Burgess-Dunne hydro type, having a 46 ft. span and without rudders.

The six Harvard graduates who will operate the above machines and who are now learning to fly at Marblehead are Gordon Balch, Norman W. Cabot, George Feating, Dr. John C. Phillips, Godfrey L. Cabot and James J. Cabot.

Mr. Henry Joy, president of the Packard Motor Co., recently paid a visit to the works of the B. F. Sturtevant Company, Hyde Park, Mass., and spent considerable time in inspecting the aeronautical motor department. Mr. Joy was especially interested in the 140 h.p. eight-cylinder aeronautical motors which are being produced in large quantities.

Mr. H. E. Norton, Chief Engineer of Gas Engine Design, states that the new aeronautical motor testing plant which is now rapidly nearing completion will be provided with special facilities for testing the motors with propellers under conditions approximating those which the motor would undergo in actual flying service.



### New Aircraft at the Chicago Aero Works

The Chicago Aero Works have been busy all fall. Another Stupar tractor will be delivered in a few days to William H. Couch, who is well known in Chicago and the Middle West. Mr. Couch claims that he cares nothing for rain, sleet or Jack Frost, and his record for bad-weather flying appears to bear this out. He will fly this new Stupar tractor frequently during the winter throughout Illinois and Iowa.

The Chicago Aero Works are also rushing to completion a Scout tractor biplane, with a speed of over 100 miles an hour, to demonstrate to the Government officials that the aeroplane manufacturers of this country are well able to supply the needs of our Army and Navy.

In addition, the company is building for Raymond Carroll, one of the factory force, a Juvenile Stupar tractor, which it is believed, will be something new in aeronautics. It is a small plane, but very sturdy and requiring less engine power than any aeroplane ever seen around Chicago.

In the near future, so Mr. Renton, the president, states, the company plans to build some triplanes of the war type, with over 100 feet spread; and also a passenger-carrying craft larger than the Russian Sikorsky machine, to carry twenty passengers.

Cicero Field, which for so long has been the favorite ground of the Chicago aviators, is now a thing of the past. It has been cut up into streets and building lots, and this scene of so many aerial exploits is being swiftly covered with houses.

### Efficient Life Preservers for Aviators

With the view of providing a light, convenient and efficient life preserver for use in hydroaeroplanes, the Robinson-Rodgers Co., of Newark, N. J., has for the past two years developed the patented life preservers invented by Lieut. S. P. Edmonds, U. S. Coast Guard, retired. These life preservers are made with Ilanasilk filling and are specially designed. They are used extensively by Government aviators and others, and through them several lives have been saved when the wearers have fallen in water.

The U. S. Steamboat Inspection Service classes all hydroaeroplanes with motor boats, and they have to be supplied with the same life preservers as such boats. Where passengers are not carried for hire the Universal Ilanasilk life preservers and cushions are permitted and used, but where even one passenger is carried for hire the heavy, unwieldy cork belt must be carried in the hydroaeroplane.

In order that this cork belt may be eliminated and Universal Ilanasilk life preservers as always worn in place by the aviator and passenger, may be used without carrying the cork belt, the

Robinson-Rodgers Co. is applying for approval of these life preservers before the Steamboat Inspectors. The next meeting occurs late in January, 1916, and aviators or associations interested in securing such approval as will permit them to leave out the cork belts should at once write to the Robinson-Rodgers Co. regarding the subject. It can thus be fully discussed and a strong appeal be made for the improved equipment.

### Has Made 400 Exhibition Flights

Aviator O. E. Williams, who recently returned to Fenton, Mich., has made during the season just closed 400 exhibition flights. At the Cotton Palace in Waco, Tex., his night flights were made especially attractive by the illumination of his plane with electric lights and by the use of a large flash light. During the winter he will have a class in aviation, who will receive their first lessons on the ice at Long Lake.

### Frank W. Goodale in Brockton

Frank W. Goodale has been making flights in his dirigible at the fair grounds in Brockton, Mass., on a schedule of two a day, and on one occasion he varied the programme by circling over the city and dropping harmless bombs on prominent buildings.

A local newspaper announces that a representative of Henry Ford had arrived in Brockton for the purpose of engaging Leo Stevens, Mr. Goodale's manager, to supervise the manufacture of dirigibles of the type Goodale flies. Tentative plans, it is said, call for a dirigible that Ford would manufacture and sell for \$850, and if the deal goes through, Goodale is to be used in the capacity of an instructor.

On the invitation of Dr. Rufus Bernhard von Klein-smid, President of the University of Arizona, Miss Stinson addressed the student body of the university on the methods of instruction in aviation schools. The same day she made an address before the Tucson Luncheon and Advertising Club, the first time that a woman had ever been present at a meeting of the organization.

Arrangements are under way to add to the course of instruction at the Arizona State University a department of aeronautics.

### Savannah, Ga., Wants an Aviation School

The Tourists Bureau of Savannah, Ga., is anxious to bring an aviation school to that city and has been in communication with the Wright company with such success that Philip Boyer, of the company, promised the bureau he would stop off in that city and make an investigation.

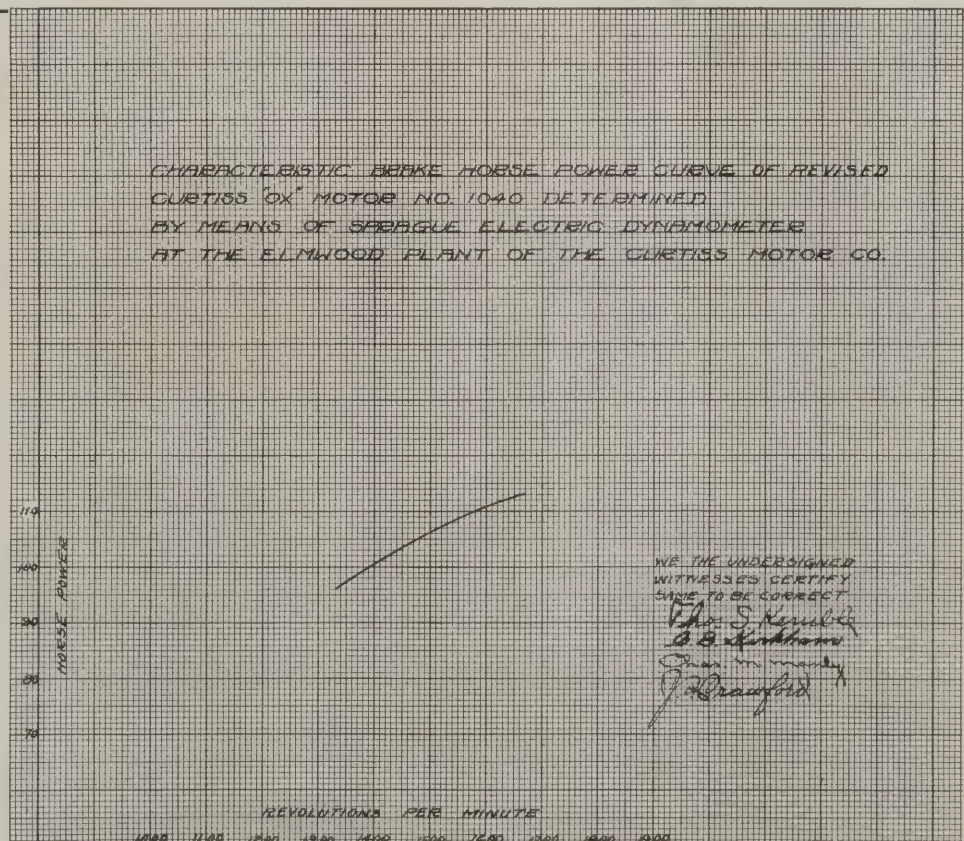
### MODEL OX, 90-H.P. CURTISS MOTOR DEVELOPS 112.7 H.P.

Following an 8-hour test run reported in a previous bulletin, Model OX motor No. 1040 was given a maximum horsepower test at various speeds with the following results:

1350 R.P.M.	96.5 H.P.
1460 R.P.M.	104.5 H.P.
1540 R.P.M.	107.8 H.P.
1650 R.P.M.	112.7 H.P.

This test was conducted at the Buffalo plant of the Curtiss Motor Company and was witnessed by official observers.

Previous to this test, the motor was run one hour at 1400 r.p.m., developing an average of 90 h.p. with a fuel consumption of 8 gallons.





## TESTING AEROPLANE ENGINES

AS aeroplanes have increased in size, speed, and carrying capacity, the requirements placed on the engines have increased in severity. Increased power, and the ability to sustain it indefinitely, is demanded. Performance specifications, especially on the part of Government agents purchasing aeroplanes for military use, are becoming very rigid. The performance of the engine must be demonstrated, not only in the plane, but on the block before it is assembled into the plane, and often again after an extensive work-out in actual flight.

Manufacturers are becoming increasingly desirous of demonstrating by actual, witnessed tests, the performance of their machines. Actual test curves of motors are reproduced in the trade papers; "140 Real horsepower," we read in one advertisement. Engines and planes are being sold on what they actually can do, not upon general representations.

For the testing of aeroplane engines, the Sprague Electric Dynamometer is especially suited. Because of its great accuracy, ease and fineness of control, wide speed range, wide load range, and inherent torque characteristics, it is better adapted for testing gasoline engines than any other type of Dynamometer.

The Sprague Electric Works of the General Electric Company has manufactured Electric Dynamometer sets for more than thirty of the leading automobile and engine manufacturing plants of this country, and has developed a line of Dynamometers especially for aeroplane engine work. Sizes

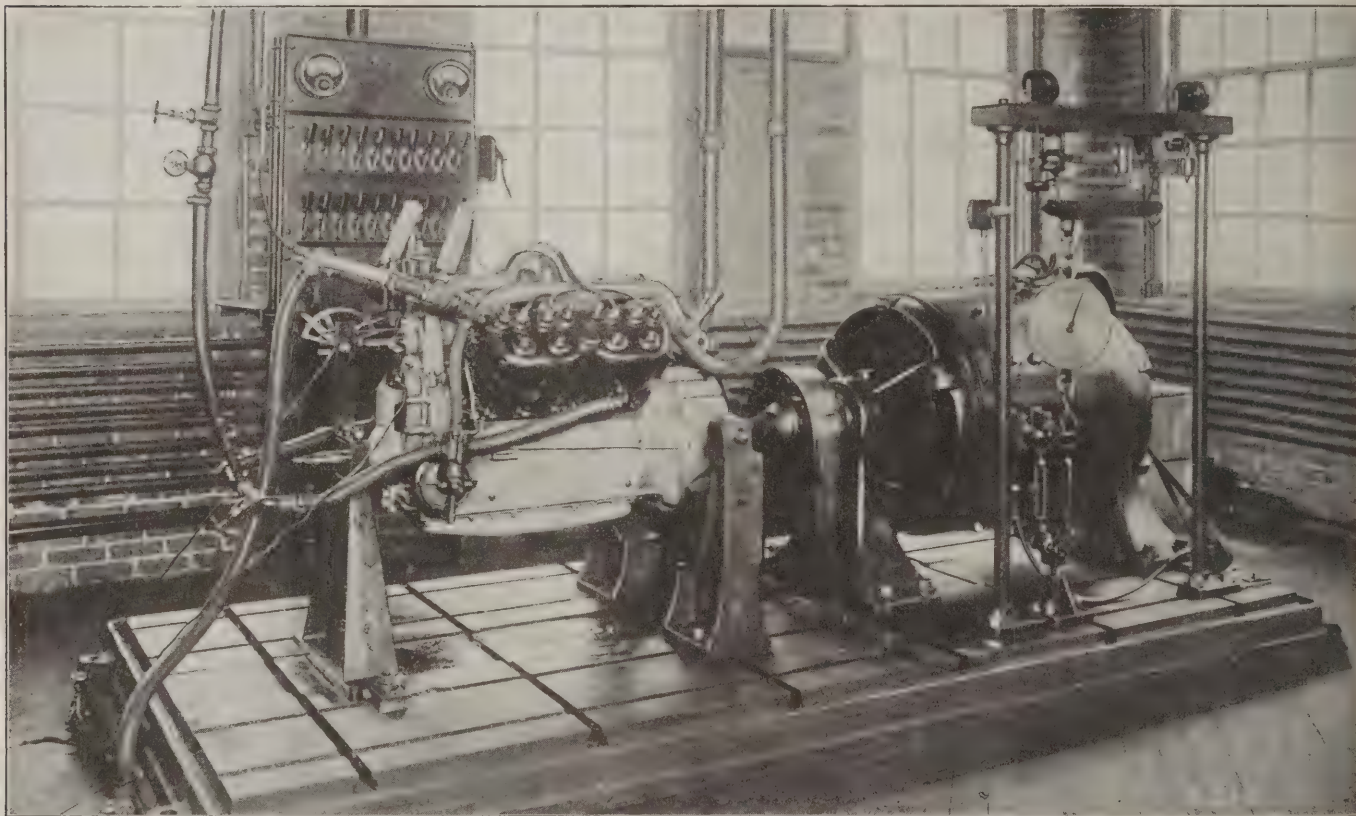
of 150 h.p., 200 h.p., 300 h.p., and as high as 500 h.p. are built, the speeds of the sets being adapted both for direct coupled engines, 1,500 r.p.m. and below, and for geared engines, with speeds up to 3,500 r.p.m. The power curve of the Curtiss V2 motor, reproduced in our November 22nd issue, was made on one of the 150 h.p. units. The Sprague Electric Dynamometer is used by the United States Government in aeroplane engine testing, with units in both Annapolis and Washington.

The Sprague Electric Dynamometer tells the truth about an engine. It can put the engine through its paces in a way which can leave no room for doubt as to its performance under the most gruelling loads.

And yet the operation of the Dynamometer is extremely simple. The load and speed can be varied throughout the range from zero to maximum, and back again, by simply turning a field-rheostat handle. The only readings to be taken are the speed, on a tachometer, and the torque, on a set of special scales.

The Sprague Electric Works furnish all the necessary accessories with the Dynamometer for making complete tests, including engine stands, test bases, couplings, gasoline-meter tachometers, torque measuring scales, and complete control apparatus.

The accompanying cut illustrates one of these Dynamometers testing a well-known 8-cylinder automobile type engine in one of the big Detroit plants.



Sprague Electric LC-50 Dynamometer Testing a Cadillac Motor at Cadillac Plant, in Detroit.

### Oklahoma Will Organize Aero Squad

The National Guard of Oklahoma has been very much interested in establishing an aviation section since last summer, when the Aero Club of America offered to provide an aviator and an aeroplane for their maneuvers. A recent letter from the Adjutant General follows:

My Dear Sir: I am in receipt of your Bulletin No. 46, for which please accept my thanks.

I heartily approve of the plan suggested in this bulletin of sending Militia officers to the aeroplane schools and hope to be

able to have an officer or man available to send to this school as soon as sufficient aeroplanes are provided for instruction.

Very truly yours,  
(Signed) F. M. CANTARE,  
The Adjutant-General.

### Ready To Send Militia Officers to U. S. Aviation School

The following letter from the Adjutant-General of the State of Minnesota has been received: "I am directed by Governor Hammond to inform you that, as per yours of October 11, the Organized Militia of Minnesota would be pleased to avail themselves of the opportunity set forth in Bulletin No. 46.

(Signed) "FRED. B. WOOD,  
"Adjutant-General."



## Sturtevant All-Steel Battle Aeroplane Makes Successful Flights

THE all-steel battle aeroplane constructed by the Sturtevant Aeroplane Co., at Jamaica Plain, Mass., after a design entirely new in aeronautical engineering, was flown at Readville, Mass., on Sunday of last week.

Henry Woodhouse, a Governor of the Aero Club, who has watched the development of this type of machine from the day that the plans were drawn, gave the details of its construction and performances under test to a reporter of the *New York Times*.

"This is perhaps the greatest development of the battle-plane yet made," he said, "and its adoption by the Government will place the United States in a position to lead the world. Its most novel features are the gun turrets.

"The machine is a biplane, about fifty feet over all on the wings, and owing to its vanadium steel construction is of exceptional strength. Unlike any other design now in use for gun-bearing aeroplanes, the gun turrets are placed at the far ends of the wings. They are, roughly, eight feet long by two and one-half feet wide, and will hold a rapid-fire gun and its gunner with ease. The great advantage this design gives is that it will allow the gun a vertical arc of fire of more than ninety degrees, while the horizontal arc is well over 200. These guns will be heavy enough to destroy other aeroplanes or dirigibles, and combined with the bomb equipment will make the United States battle-plane a most efficient engine of war.

"The vanadium steel construction is another great advance in aero construction. The entire plane is of this steel, which is lighter than wood, and it has this advantage combined with much greater strength. It is built of a number of steel units; that means that the size of the aeroplane can be increased to any reasonable extent, even as great as 500 feet across the

wings. All these units are standardized and are stamped out by machines of similar design.

"The constructor can build the machines just as a child puts one of those mechanical building toys together. It is only a question of deciding the use to which the aeroplane is to be put, and then he goes ahead and builds a machine of the carrying power and strength that is needed. For war use, this feature will be of inestimable value and will obviate the troubles that crippled the air squadrons of the Allies at the beginning of the war when machines were laid up for weeks at a time on account of lack of parts.

"The motor used is 140 horsepower, and, like the machine, was built by the Sturtevant Aeroplane Company, Boston. It is the regular type aviation motor and can be built to any horsepower required. Grover C. Loening of this city, who was formerly chief aeronautical engineer of the United States Government, and who resigned last summer for the purpose, designed the new battle-plane. He has had a long experience in aeronautics, and started with the Wrights.

"Although designed primarily for military purposes, the new plane will be very useful for mail and express carrying. Instead of placing guns in the turrets, mail or express packages may be packed in them, and special weather-proof containers have been built for this purpose. The weight-carrying capacity of the new machine has not yet been announced, but it is known that each turret can hold more than 500 pounds with safety and without lessening the speed.

"Compared with the aeroplanes now being sent to Europe, this machine is about the same size as the 'Canada' class being built by the Curtiss Company in Toronto for the British Government. These have been very efficient and it is expected that the new two-turret flier will rival their record."

## Twenty-Four States Organizing Aero Corps

The Aero Club of America has replied with a hearty offer of co-operation, and has offered to add 10 per cent. to any sums raised by February 1, 1916.

### Arizona Aero Detachment Progressing

The Aero Club of America has offered to co-operate with the Arizona Aero Squadron Association in raising the funds for aeroplanes for the National Guard of Arizona. It has offered to add 10 per cent. to all sums raised by February 1, 1916, and has allowed \$400 from the National Aeroplane Fund to be used to train an officer of the National Guard of Arizona in aviation. The following letter has been received from Adjutant-General Charles W. Harris, of the Arizona National Guard:

"Gentlemen:

"I am in receipt of your letter regarding the assistance to be given to our squadron at Tucson. The members of this organization are enlisted in the National Guard and have volunteered for this service.

"I have been unable to give much time to this work personally because of the serious conditions in this State due to labor troubles, but have encouraged the men in every way possible that have volunteered for this service.

"Tucson has the finest climate in the United States for the location of a winter's school, and we have a rifle range of five sections, located a few miles east of Tucson, that would be available for this purpose. I feel positive that it would pay you to look into this proposition with the idea of the establishment of a school at Tucson, when it is practically impossible to do any flying in the East. Should such a proposition be considered, I am sure the citizens of Tucson would raise funds to aid in the construction of necessary buildings in the establishment of a permanent camp.

"Very sincerely yours,

(Signed) "CHAS. W. HARRIS,  
"The Adjutant-General."

### South Carolina Wants Aeroplanes

The following letter from the Adjutant General of South Carolina has been received:

My Dear Sir: I have been in constant receipt of various circulars from your office regarding matters of interest to the

general public along the lines of preparedness for coast and interior defense for the Army and Navy, insofar as aviation is concerned. I shall be glad to have you advise me just what is necessary to procure at least one aeroplane and one hydro-aeroplane for use in the Naval Militia and the Infantry branch of the service. The great trouble that confronts this state is the lack of funds with which to procure these necessary machines, and also to give to the officers necessary to handle them the proper training they must have.

If you can aid me in this matter I shall appreciate the information requested at your earliest convenience.

Yours very truly,

(Signed)

WILLIAM W. MOORE,  
The Adjutant-General.

### Oregon Naval Militia Work

The Oregon Naval Militia was one of the first bodies to take up the work of organizing an aviation section. The use of a plane was obtained, but unfortunately it was damaged recently. Commander G. F. Blair, of the Oregon Naval Militia, writing from the U. S. S. *Boston*, Portland, Ore., advised Mr. Alan R. Hawley of the accident. The letter follows:

"From—Commanding Officer

"To—The President, Aero Club of America

"Subject—Aviation Corps, Oregon Naval Militia.

"Ref: (a) My letter No. M-107.

(b) Your letter of July 19, 1915.

"1. The 'plane which applicants for the Naval Militia Aviation Corps had contemplated using for their test flights has been badly damaged, and it will be necessary to postpone the flights arranged for until the machine can be repaired or another one secured in its place.

"2. Information is requested as to whether or not, in the event Oregon succeeds in organizing an aviation section with one or more licensed pilots, any assistance can be given by the Aero Club either by the donation of a 'plane or of funds. With the limited means of the Naval Militia the equipment of the corps presents a serious problem.

(Signed)

"G. F. BLAIR."

A check for \$250 was sent to Commander Blair for repairing the damaged 'plane and an offer was made to add 10 per cent. to any sum that the Oregon people may subscribe towards buying new equipment before February 1, 1916.



## THE ALBATROS RECONNAISSANCE BIPLANE



WE are indebted to our English contemporary *Flight* for the following data concerning the latest model of the German Albatros reconnaissance biplane, three of which type were captured by the British recently.

In its general arrangement the reconnaissance type does not differ to any great extent from the larger machines seen at Hendon before the war, but numerous details have been improved and altered as a result, no doubt, of the lessons learned since then in actual warfare. One of the chief characteristics of the older machine—namely, that of building up the fuselage without the use of wire bracing—has been retained, so that it would appear that this form of construction has stood the test of time. The main frame of the Albatross fuselage consists of six longitudinals, of which the two lower ones are ash and the rest spruce. At intervals of a couple of feet these longitudinals are connected by struts and cross members swelled out where they pass the longitudinals and abutting with their ends on small angle pieces, also of wood, the latter surrounding the two inner sides of the longitudinals. Instead of the usual wire bracing rigidity is obtained by a covering of three-ply wood screwed to the longitudinals, a form of construction which was criticised by several experts, but which, nevertheless, seems to have stood up to the hard usage of aerial warfare in a satisfactory manner.

In the stern the body flattens out to a horizontal knife-edge, somewhat after the manner of the Morane monoplanes. In order to strengthen the body at its shallowest part, and also to furnish a rigid support for the steel tube that serves as a pivot for the rudder, a short keel-like fin of wood runs along the bottom of the body from the stern forward to the tail skid supports. Seen from the rear this keel is shaped like a T with the angles between its vertical and horizontal members rounded off. A turtle back runs along the entire top of the body, its highest point being just in front of the observer's seat.

Mounted on two stout longitudinal bearers, which are in turn supported on transverse members of ply wood, is the 128 h.p. Mercedes engine. The usual Bosch hand-operated starting magneto is fitted so that, after swinging the propeller to draw a charge into the cylinders the mechanic can get out of the way, leaving the actual starting of the engine to the pilot.

The two seats of the reconnaissance biplane are placed in tandem, with the observer in front. To the left of the observer's seat and in the floor boards of the body is a circular opening closed by a trap door, through which evi-

dently bombs are dropped. In front of the observer is mounted a wireless transmitter, current for which is furnished by a small generator mounted on the front right-hand chassis strut. The generator for the wireless set, instead of being driven from the engine, is driven by a small propeller, or, more correctly, from a windmill shaped like a two-bladed propeller. The antenna of the wireless set takes the form of a stranded copper cable passing from the observer's cockpit through a short copper tube with a bell mouth. At its lower end this antenna is weighted with a piece of lead so as to prevent it from being blown straight back by the force of the wind. When nearing the ground the observer winds the copper cable up to prevent it catching in obstacles when making a landing.

The gasoline is carried in a main tank under the observer's seat, and the fuel is forced by a pressure pump to the little streamline service tank mounted on top of the upper wing, whence the fuel is gravity fed to the carburetors. Filling the main tank is accomplished through a little circular door in the right-hand side of the body.

On each side of the body is mounted a radiator of a type which is very popular in Germany. It is known as the Hazet radiator, and its chief claim to notice is that it is built up in sections, and that, therefore, by adding or taking away one or more sections any size engine or any climatic conditions can be suited. The two tubes, placed top and bottom, respectively, which connect the various sections of the radiator are parallel with the sides of the body, and each section of the radiator is therefore set at an angle of the tubes so as to bring them into the line of flight.

The wing spans of the reconnaissance type of biplane are a good deal shorter than in the older models, and there are only two parts of inter-plane struts on each side instead of the three which the older models had.

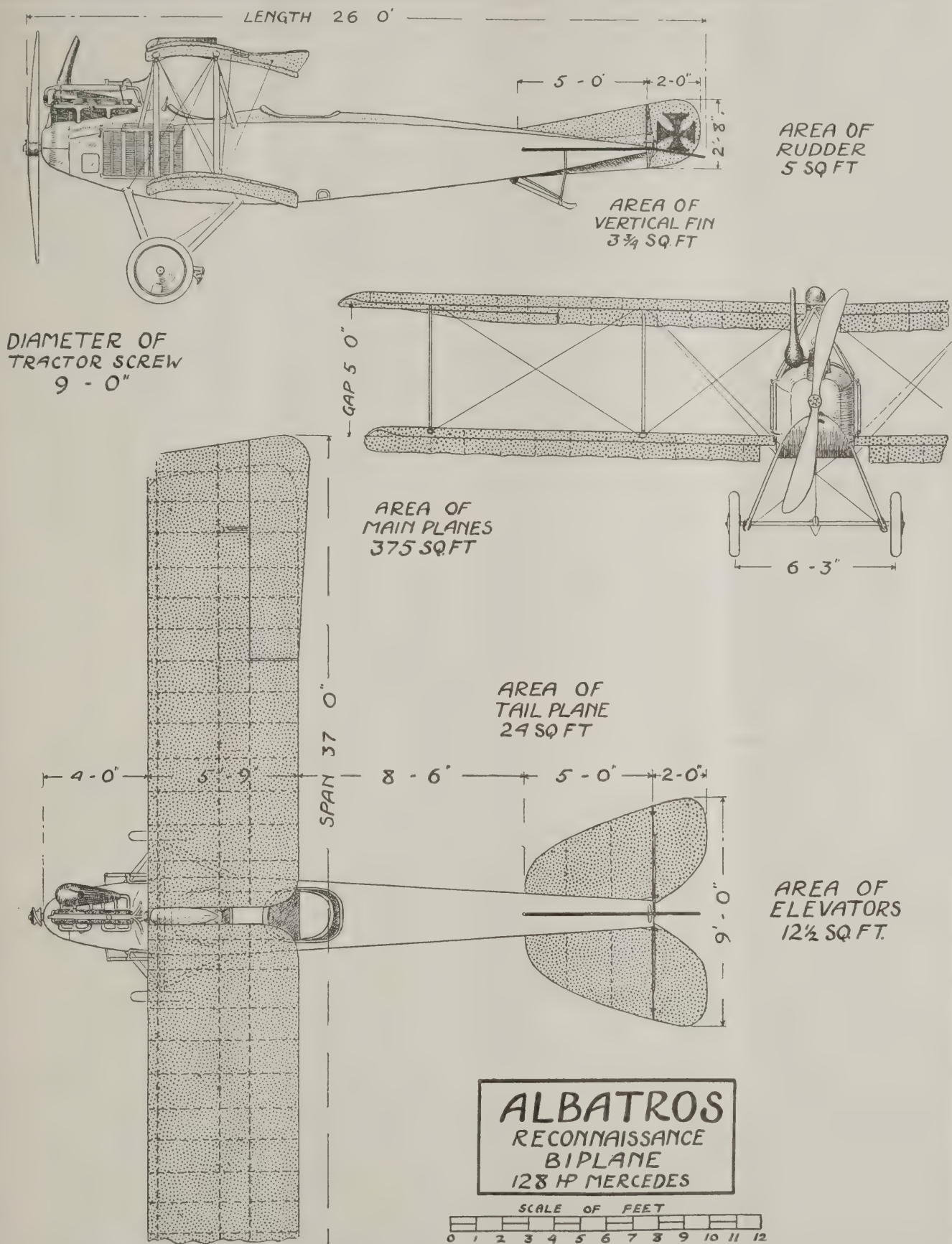
The inter-plane struts are streamline steel tubes tapering towards the ends, where they fit into eyebolts going through the main spars. A steel shell rests on a fibre pad that is shaped to fit the curvature of the plane. Inside this shell is carried a steel ring to which are attached the turnbuckles of the bracing cables. The two main spars of the wings are placed comparatively close together, giving a rather great amount of unsupported trailing edge. A short distance behind the main rear spar is another spar, or perhaps it would be more to the point to call it a former since none of the bracing cables are attached to it, forming at its outer portion a support for the aileron hinges. The ailerons, fitted to the top plane only, are given an upward turn towards the tip so as to make their outer ends meet the air at a negative angle of incidence, an arrangement which appears to have been chosen with a view to rendering the ailerons more efficient, inasmuch as the one on the high side is already having a depressing effect when in its normal position, increased immediately as soon as the aileron in question is moved upwards, while with the ordinary form the aileron has to move first up to the angle of no lift and then still further in order to meet the air at a negative angle of incidence.

The undercarriage is of the simple "Vee" type, having streamline steel struts that fit with their upper ends into sockets on the lower longitudinals of the body. The apexes of the two "Vees" are connected by a transverse tube, and the tubular axle rests in the angle between the struts. The rubber shock absorbers are wound around the apex of the "Vees" and are protected against contact with the ground by leather guards, strapped to the struts and passing underneath the shock absorbers.



Three-quarter front view  
of the Albatros biplane







# BALL BEARING TESTS INVOLVE ACCURATE APPARATUS

By ARTHUR V. FARR

(Continued from page 253)

FOR fatigue limit, direct fatigue tests are performed in accordance with Wohler's method, which briefly consists of a shaft of steel rotating in two ball bearings and driven by a belt pulley from an electric motor, as shown in Fig. 4. The test piece is at each end of the shaft and is loaded at its outer end with a load resting with a ball bearing on the test piece. For each revolution a surface fiber of the material passes through a cycle of rest and maximum stress in each direction. A speed of 1,400 r.p.m. is used with the starting load as near the fatigue limit as possible in order to shorten the time of the test. After each 2,000,000 revolutions, the load is increased until fracture ensues. The highest load, without causing a fracture, is the limit of fatigue. The method is illustrated in Fig. 10.

## Resistance to Shock

Resistance to shock is measured by tenacity, and to ascertain the degree of this property shock tests are made with a Charpy's hammer having a capacity of 72 ft. lb. This hammer gives a blow of measured impact by permitting a known weight attached as a pendulum to fall through a given number of degrees against the test piece.

Resistance to wear or hardness is tested for in the Brinnell machine. With this a hardened steel ball is forced under hydraulic pressure against the polished surface of the steel being tested. The quality of the material is judged by the size of the indentation due to the pressure of the ball on the test piece. The ball size used in the S. K. F. laboratory is 0.2 in. and the pressure 22,000 lb. For very hard steel, Professor Marten's scoring method is used. By this process the polished surface is scratched by a diamond under a fixed load. The width of the scratch gives a comparison of the hardness. Reboundimeter or scleroscope tests are also used.

## Direct Grinding Testing

Fig. 2 shows the S. K. F. direct grinding wear testing machine on which two test pieces are fixed simultaneously to a moving arm which carries them backward and forward over a rotating disk. This method gives a combined comprehension of hardness and elasticity and is exceedingly accurate in its work.

The direct tests on the finished ball comprises one for elasticity by the Marten's mirror process as shown in Fig. 13, and one for harness as shown in the illustration in which three balls are placed one upon the other. These are loaded and unloaded three times up to a certain given pressure, and after each series of loadings the center ball is taken out and the permanent set measured. If trials are performed with a number of balls of different diameters, the curves as shown in Fig. 12 are obtained by plotting the squares of the ball diameter as abscissae and the permanent set in millimeters as ordinates. With the curves it is possible by comparison with a standard set of curves to determine whether the balls are hard enough or not. This provides a ready and exact means of comparison.

In testing the finished races for accuracy, a special appliance such as shown in Fig. 5 is used to determine the equality of the thickness of the outer race. With this apparatus the race is slowly revolved on a mandrel, and the small errors are indicated on the dial of the instrument. For the inner race a similar method is used. In meeting the limit requirement, the measurements are made on combination gauges which are designed to be accurate to within 0.000039 in.

## Allowable Tolerances

The following tabulation gives the allowable limits:

- For the bore—
  - Maximum  $\pm 0.005$  mm. (0.0002 in.)
  - Minimum  $- 0.010$  mm. (0.0004 in.)
- For the outside diameter of small and medium brgs.—
  - Maximum  $\pm 0.000$  mm. (0.0000 in.)
  - Minimum  $- 0.015$  mm. (0.0006 in.)
- For large brgs.—
  - Maximum  $\pm 0.000$  mm. (0.0000 in.)
  - Minimum  $\pm 0.030$  mm. (0.0012 in.)

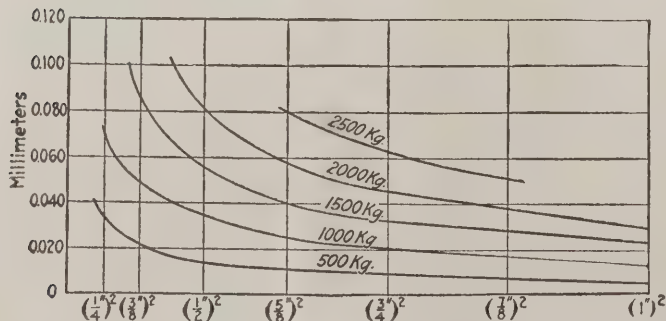
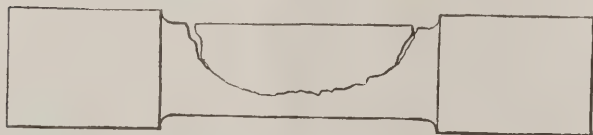


Fig. 12—Characteristic curves from ball tests.

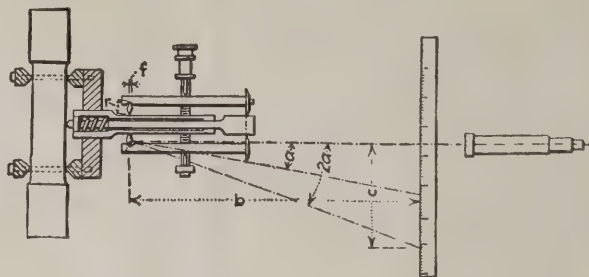


Fig. 9—Diagram of deflectometer, showing how the deflections, produced in the hardened steel test piece, are measured on the scale, the readings being made by the telescope, shown to the right.

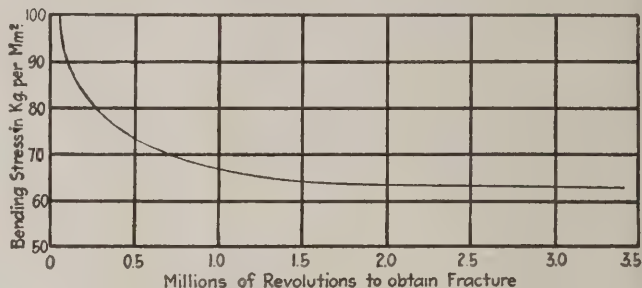


Fig. 10—Curve plotted to show the highest load reached without causing a fracture. This is the limit of fatigue.

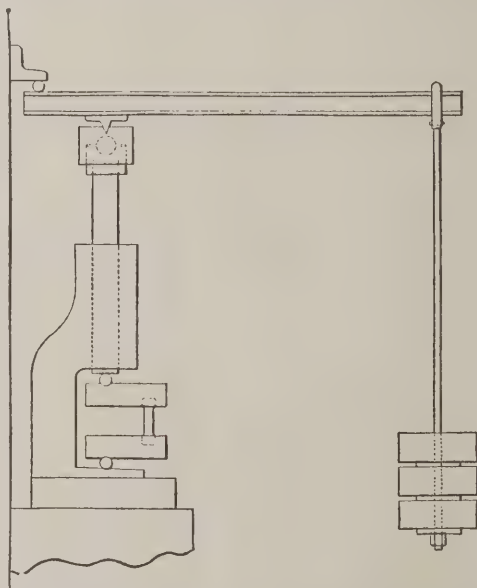


Fig. 8—Diagram of machine for bending tests, showing how the test piece is held in jaws and the system of levers.

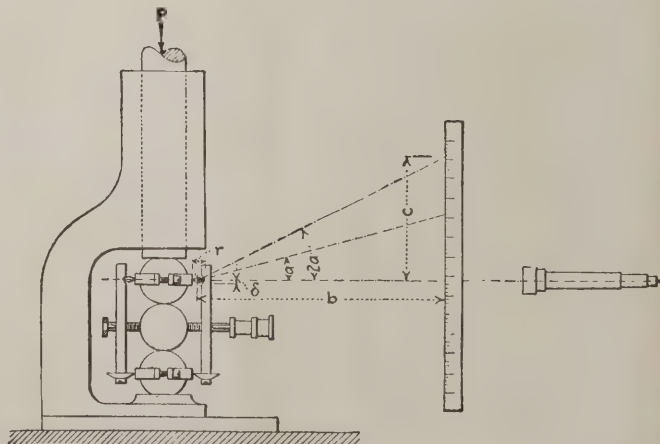


Fig. 13—Diagram of method of making test on balls. The elasticity is measured by the use of a Marten's mirror, the readings being noted by the use of the telescope.





# FOREIGN NEWS



## AUSTRALIA

The first aerial engine built in Australia was subjected to a block test some time ago by the Sydney Tarrant Motors Proprietary Limited. The test was witnessed by a number of army officers and was satisfactory to all concerned. Later the engine was taken to Werribee, where it will undergo further trials before being installed in an aeroplane.

## AUSTRIA

An Austrian seaplane squadron bombed the railway station, the electric works and points of military importance at Ancona (on the Adriatic coast of Italy) and returned unharmed in the face of a heavy fire, according to an official statement issued from the War Office.

## EGYPT

According to a Danish paper, Baron Slatin Pasha, in discussing a fresh invasion of Egypt, declared that it would be possible for the Central Powers to destroy the locks of the Suez Canal by Zeppelin bombardment and to stop all traffic through it.

## FRANCE

An early morning battle 10,000 feet in the air between a French and a German aeroplane recently resulted in a decisive victory for the French machine, and the death of the German aviators when an explosion occurred on their machine.

The French machine caught up with the German after a chase and opened fire from a mitrailleuse. The German machine took fire and was wrecked by an explosion, the pilot and observer falling to the ground within the French lines near Montdidier, east of Amiens. The official report says: "This morning one of our aeroplanes, taking up the chase, at an altitude of nearly 10,000 feet, of a fast German machine, was able to approach within a distance of sixty-five feet, and to attack it with mitrailleuse fire. The enemy aeroplane took fire immediately and there was an explosion. The two passengers fell inside our lines near Tilloloy."

The French steamer *Harmonie*, which arrived at Marseilles on Dec. 11, was attacked recently by an Austrian submarine. The submarine fired two torpedoes, which were without effect, and then withdrew. The next day the *Harmonie* was attacked by an aeroplane that flew overhead for a quarter of an hour and dropped six bombs, all of which fell into the sea.

Before William Thaw, Eliot Cowdin and Norman Prince, the American aviators in the French army, could sail on the Rotterdam for eight days' leave in New York considerable difficulty arose regarding their nationality, owing to the fact that America, as a neutral country, refuses passports for citizens in the service of belligerent armies. The matter was settled by giving them French passports, describing them as subjects, since they were officers in the French army. Under the regulations their first-class return passages are paid by the French Government.

## GERMANY

A French aeroplane was obliged to land south of Bapaume, the Western front, on Dec. 9, and the occupants were captured and imprisoned.

## GREAT BRITAIN

Lieut. Herbert Sanford Ward, of the Royal Flying Corps descended behind the German lines on Nov. 2. His fate is unknown, and the British ambassador at Washington has requested the United States to ascertain whether he is living or dead. The State Department at Washington will use its good offices to obtain the desired information. Lieut. Ward is a brother-in-law of Coville Barclay, counsellor to the British Embassy at Washington.

Sixteen British aeroplanes bombed a stores depot at Miraumont, (Somme district), and the aerodrome at Hervilly. The attack was carried out in a high westerly wind, which made flying difficult. All the machines returned safely, and considerable damage is believed to have been done both objectives.

Three German hydroaeroplanes made an attack on a British cargo boat which ran aground off the coast of Belgium and they attempted to destroy her with bombs. The attack was witnessed by Allied scouts, and a squadron of Allied aeroplanes flew to the rescue. The counter attack was immediately successful, the Germans taking refuge in flight. French torpedo boats also appeared on the scene and despite a sharp fire from a German battery they succeeded in floating the freighter and escorted her out of the zone of danger.

Unfavorable weather has limited the work of the aviation corps in the Western theatre of war, but the aviators have nevertheless been active. Two machines which went on a reconnaissance on Dec. 5 and on Dec. 9 the government reported that they had not returned. The fate of the crews is unknown.

## MONTENEGRO

One Serbian soldier was killed on Dec. 8 when an Austrian aeroplane appeared over Scutari and threw down three bombs.

## TURKEY

An official bulletin declares that six aeroplanes which had been captured from the Allies have been repaired and are now being used against the Allies on the Mesopotamian front.

## SOUTH AFRICA.

The Royal Flying Corps has sent out an official communication inviting applications for enlistment in the Royal Flying Corps (South African Squadron) wireless operators, cooks, coppersmiths, motor cyclists, sailmakers, electricians, riggers, fitters, turners, motor mechanics and instrument repairers were wanted.



The Pyramids as Viewed from a Warplane of the Allies.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

### THE AERO SCIENCE CLUB OF AMERICA

29 West 39th Street New York City  
PACIFIC NORTHWEST MODEL AERO CLUB

915 Ravenna Boulevard, Seattle, Wash.

LONG ISLAND MODEL AERO CLUB  
401 Grant Avenue, Cypress Hills, L. I.

BAY RIDGE MODEL CLUB  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

### DETROIT AERO RESEARCH AND MODEL CLUB

c/o William P. Dean, 1717 Concord St., Detroit, Mich.

### BUFFALO MODEL AERO CLUB

c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.

THE ILLINOIS MODEL AERO CLUB  
Room 130, Auditorium Hotel, Chicago, Ill.

TEXAS MODEL AERO CLUB  
517 Navarro Street, San Antonio, Texas

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Springfield, Mass.

MILWAUKEE MODEL AERO CLUB  
455 Murray Ave., Milwaukee, Wis.

CONCORD MODEL AERO CLUB  
c/o Edward P. Warner, Concord, Mass.

PLATTSBURG MODEL AERO CLUB  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.

MODEL AERO CLUB OF OXFORD  
Oxford, Pa.

### Aero Science Club of America

The club was somewhat disappointed in not having Mr. Lesh present at the last meeting, but disregarding this fact an interesting meeting was held. A general discussion took place with regards to Zeppelins in the present war.

It was agreed upon at the meeting to try to obtain permission to use Governor's Island to carry on experimental work. The majority of members agreed that this would be an ideal place for such purposes. Word was received from Messrs. McMahon and Schober that both had completed new machines with compressed air motors and successful flights were made. Both members will deliver lectures on compressed air motors during the month of January.

Mr. Meyers reported that at the last meeting of the Elmwood School Model Aero Club many new members were present and the work which was started at the previous meeting was continued. Mr. Cavanagh will represent the Aero Club at the next meeting. For further particulars address the Secretary, 29 West 39th St., City.

### Illinois Model Aero Club

The Society of Automobile Engineers of America invited Arthur E. Nealy to demonstrate models before its members on December 9, and all were delighted with the exhibition. The convention was held in the Pontchartrain Hotel, Detroit, Michigan. Mr. Nealy took from the club an assortment of loop-the-loop models, tractors, hydroplanes, scale and distance models.

Before this Engineering Society Mr. Nealy predicted that within five years aeroplanes would be as common as horses, and that when large aeroplanes can rise as quickly and fly with the stability of models, automobile men would have to construct aeroplanes to keep their factories busy.

The two convincing flights of the evening were made by a model that rose directly to the ceiling with a run of an inch and a half, and another exceedingly spectacular flight made by a hydro model of Mr. Pease' construction which rose with an eight-inch run from a common meat platter filled with water, and which in addition executed a beautiful loop. This exhibition before such an organization was a great boost for model aviation.

### The Dean Model

Mr. William P. Dean, the well known English model flyer, and at the present time the head of the Detroit Aero Research and Model Club, writes us a very interesting letter.

Mr. Dean states that his model is a type of machine lately originated by him and is one which he believes will give better results than those heretofore in use. He states that the following are advantages obtainable with this type of model:

"1. The center of pressure nearly coincides with that of full sized machines.

"2. The main plane can be reduced in span and surface by a utilization of a tail plane such as shown.

"3. The very important point of raising the elevator well above the fuselage, which makes the whole design agree more with the carrying surfaces of the bird, and seems to give better results in supporting the weight at the front of the machine.

"4. Employment of smaller sized propellers on machines of great length, which means greater number of revolutions for actual flight power.

"5. Considerable reduction of head resistance in the general design, and ease with which adjustments may be made.

"6. The machine can be used without elevator by sliding forward the main plane so that the center of gravity falls immediately behind the plane."

Mr. Dean also states that this type of machine can be used as well with biplanes, the center of propeller thrust being

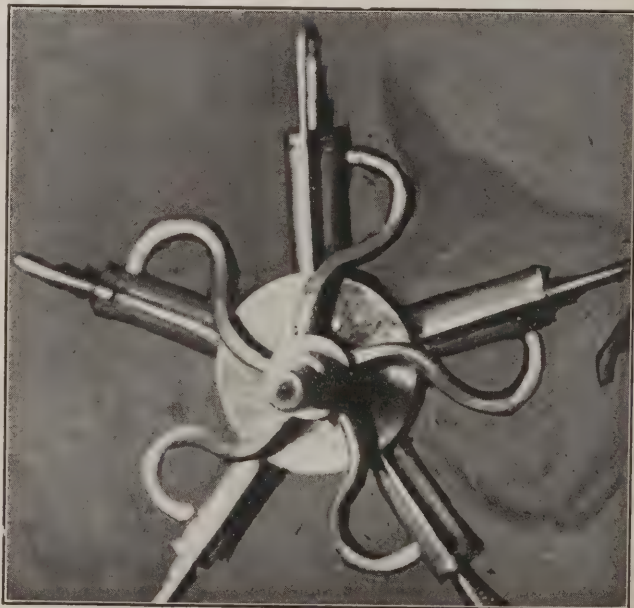
placed nearer the upper plane instead of directly between the planes as is generally the case.

The general dimensions of the model are as follows: Length of main stick or fuselage, 48 inches, span of main plane, 32 inches; chord at center,  $4\frac{3}{8}$  inches; chord across tips,  $6\frac{3}{8}$  inches; length of tips, 7 inches. Tail plane, width, 8 inches; length  $11\frac{1}{2}$  inches. The elevator is made of thin sheet aluminum and has a span of 9 inches; chord,  $1\frac{3}{4}$  inches. It is mounted upon a frame of wire so that it is elevated about an inch above the main stick. The tips of the elevator are slightly bent down. The propellers are of twisted wood and are  $9\frac{1}{2}$  inches in diameter. Each propeller is driven by 12 strands of  $\frac{1}{8}$ -inch flat rubber. A small aluminum fin is used at the front of the model, which Mr. Dean states is very conducive to straight flight. In order that the main plane can rest securely on the single stick, a framework of  $\frac{1}{8}$ -inch square bamboo is provided as shown in the drawing.

### The Wise Compressed Air Motor

The use of the compressed air motor as a means of propulsion is becoming more evident as the interest in model flying increases. A short time ago it looked as though the compressed air motors were being used only by flyers in the East.

The motor made by Mr. Wise is a five-cylinder rotary type and weighs but four ounces with propeller and mounting frame. On 15 lbs. pressure the motor will turn over 1,000 r.p.m. The connecting rods are fastened to crankshaft by segments, and are held by two rings, making it possible to remove any one piston without disturbing the others, by taking off the nut and one ring. The crankcase is made from seamless brass tube the cylinder being brazed in. The valve cage and cylinder head are turned separately and also brazed. There is but one ring to a piston. The bore is 11-32 of an inch and stroke 7-16th. "Pull" rods instead of "push" are used to operate the valves. Pull rods instead of push rods being used to overcome centrifugal force. The crankshaft has one post which is uncovered in turn by each inlet pipe as the motor revolves. The "overhang" method is used to mount this motor to the model. The entire motor, mounting frame and tank are made of brass, with the exception of the valve springs.







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Didn't Mean Just That

The Cook: "Sir! Sir! There's a Zep'lin outside, and if you don't come wi' the keys of the cellar, we'll be in—in—Heaven in a couple o' minutes!"  
The Curate: "God forbid!"

#### Too Evident

Nervous Old Lady (on small English air bus). Oh, dear! How we're rocking! I'm sure an accident will happen to this machine!

Elderly Aboriginal.—It's along o' their bein' short-handed wi' skilled men, mum, so my son's offered to drive 'er just to oblige, and (confidentially) I don't think 'e knows much about it.

#### He Was Covered All Right

As he crawled out of the wreck of his aeroplane a solicitous friend asked:

"Are you covered?"

"Yes," he said sadly, "with mud, blood, chagrin and insurance. Is that enough?"

Don't give the elevator boy a book about aviation for Christmas. He's sick and tired of it and knows all about going up and coming down.

#### Southward Bound

The winged winds  
Fly south and south;  
The catfish finds  
The river's mouth.

The wild geese heed  
Their leader's cry,  
And southward speed  
Swift thru the sky.

Oh, birds and things,  
Your trip I'd share  
If I had wings  
Or railroad fare!

#### In the Good Old Way

(One of Br'er Williams' Faith-Songs.)

Spite er all de a'rships  
Dey riggin' up today  
I gwine ter go ter glory  
In de good ole way!

W'en the mo'ners is a-sighin'  
At de partin' er de day,  
I'll fix my wings fer flyin'  
In de good ole way!

Halleluia story—  
Frum de fur away,  
Gwine ter go ter glory  
In de good ole way!

—Frank E. Stanton, in *Atlanta Constitution*.

#### Expert Opinion

The late Henry Beach Needham, the flying expert who was killed with Lieut. Warneford in France, was often consulted by aeroplane inventors.

An inventor from Seattle submitted a triplane model to the brilliant young expert last spring. Mr. Needham studied the model attentively for an hour. Then he laughed and said: "I'd advise you, my friend, to try your hand now at inventing a submarine for one of the belligerents."

"Yes?" said the inventor, puzzled.

"Yes," said Mr. Needham, "for, judging from this aeroplane model, I am convinced that a submarine designed by you would fly."—*Washington Star*.

Sportsman: "Are you a married man? The reason I ask is that I have four young and impressionable daughters."

Air Pilot: "Well, yes, I'm married, but I could get a divorce."



Aerial Moving

Courtesy "Flight"

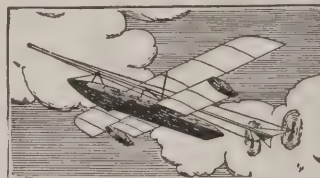


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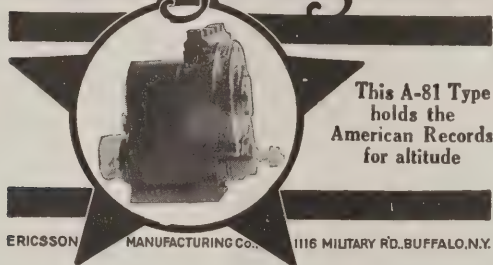
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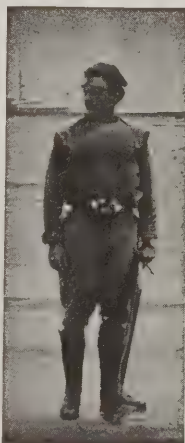
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AERIAL AGE WEEKLY

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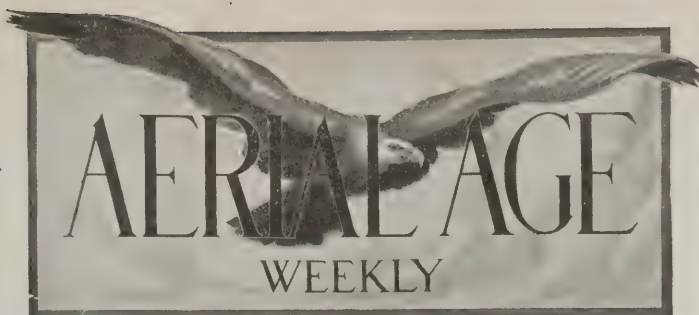
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VOL. II

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No. 15

### Aero Club of America and American Society of Aeronautic Engineers To Send Delegates to Pan-American Scientific Congress

ON December 27th, there will assemble in Washington one of the most notable international conferences of modern times. It will be more comprehensive in the range of topics discussed and in the number of delegates in attendance than any other international gathering in the history of the United States. In some respects it will be the most important Pan-American meeting that has ever had the sanction of the American republics.

Under the official designation of the "Second Pan-American Scientific Congress" there will come together in the national capital approximately 1,000 of the representative statesmen, scholars, educators, scientists and engineers of the Western Hemisphere, and they will be in session for two weeks, or from December 27, 1915, to January 8, 1916.

It is of especial significance that the Aero Club of America and the American Society of Aeronautic Engineers have been invited by the Hon. Robert Lansing, Secretary of State, to send one delegate and one alternate each to this conference, which synchronizes in admirable fashion with the excellent work which the Aero Club of America has been doing to develop aeronautics in the South and Central American Republics. In this work the Aero Club of America has had the co-operation of Alberto Santos-Dumont, the Brazilian sportsman, pioneer in automobiling and aeronautics, who made the first public flight ever made with a dirigible. Mr. Santos-Dumont is again doing pioneer work, but withal an important work opening tremendous possibilities. To popularize aviation in South and Central America means, first, to introduce a capital sport, second, to bring about the adoption of aircraft as vehicles for transportation to solve the difficult problems of transportation which limit the development of the resources of South and Central America.

A committee composed of leading people, including representatives of all the republics of the Western Hemisphere, is being formed. This committee will outline a plan of action which will then be carried out.

The first step will undoubtedly be the establishing of an important trophy which is to be competed for by representatives of all the republics of the Western Hemisphere. If it is decided that the competitors must be representatives of the aero clubs of the different republics, then aero clubs will be formed in the republics and they will appoint the representatives, following the method adopted in the case of the Gordon Bennett trophy competitions.

The formation of a Pan-American Aeronautical Federation will be a logical result. Such an organization will have work of tremendous importance to do, and if formed, as the International Aeronautical Federation is, of aero clubs of national importance, which count in their membership representative sportsmen, scientists, statesmen, and business men, it will become an organization of international importance.

There are twenty-one republics in the Western Hemisphere. They are the United States, Mexico, the Central American States, comprising Guatemala, Honduras, Salvador, Nicaragua, Costa Rica and Panama; the republics of South America,

comprising Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Argentina, Uruguay, Paraguay, and Brazil; the island republics of Cuba, Haiti, and Santo Domingo. Cuba is now an independent republic.

Aerial sport will popularize aeronautics in South and Central America, and whereas aeroplanes are developing larger, more powerful, and useful every day, the logical development will be the application of the aircraft to solve difficult problems of transportation.

Aeroplanes such as the "super-America" and "Canada," which can carry a ton of useful load at a speed of up to 95 miles an hour, for as many as eight hours without stopping, could be applied to solve many of the difficult problems of transportation of South and Central America.

The conference which is to meet in Washington will give the delegates from the Aero Club of America and the American Society of Aeronautic Engineers an opportunity to develop the plans outlined in concrete fashion, and to bring before the vast assemblage of experts of all the sciences a full knowledge of the utmost importance of developing the aerial highways of their respective countries.

The delegates who will represent the Aero Club of America and the American Society of Aeronautic Engineers at the Second Pan-American Scientific Conference will be Messrs. Alberto Santos-Dumont, Henry A. Wise Wood, Emerson McMillin and Henry Woodhouse.

### \$3,854,342 Worth of American Aeroplanes Exported

TO demonstrate that the aeronautical industry has already "come into its own," it is only necessary to reproduce a paragraph of a report recently issued by the Department of Commerce:

"Thirty-two aeroplanes, valued at \$366,892 and parts of aeroplanes, worth \$72,001, were exported during October, bringing the total value of these exports for the fifteen months ended October 31st to \$3,854,342."

And the real deliveries are only beginning!

### Aero Club of America Offers Ten Per Cent. To Raise \$480,000 for Militia Aeronautics

HAVING received requests for assistance from the heads of the Militia of twenty-four States who are anxious to secure aeroplanes for the Militia, and realizing the necessity of organizing aviation sections in the Militia of every state, the Executive Board of the Aero Club of America, in charge of the National Aeroplane Fund, has extended to every state, through the Governor, the offer to add 10 per cent. to any sum up to \$10,000 raised by public subscription or in any other way for this purpose before February 1, 1916.

In transmitting this offer to the Governors of the coastal states, the Executive Board urges that the first \$10,000 raised be used to establish a station of the Aero-Radio Coast Patrol System, which has been endorsed by President Wilson, Secretary of War Garrison and Secretary of the Navy Daniels and the leading authorities on National Defense.

The letter sent to the Governors of all the states except

**America Must be Given a Navy Equal to the Best.** If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.



New York and Rhode Island, which already have raised \$2,000 each for militia aviation, and the state of Maine, which has raised \$10,000 through the Chamber of Commerce of Portland, follows:

"My Dear Sir:—Realizing the necessity of organizing aviation sections in the Militia of every state, the Executive Board of the Aero Club of America in charge of the National Aeroplane Fund is extending to every state the offer to add 10 per cent. to any sum up to \$10,000 raised for this purpose before February 1, 1916. The Executive Board is able to do this through the generosity of Mr. Emerson McMillin, the New York banker, who has offered to add \$100 to every \$900 raised by the National Aeroplane Fund up to the sum of \$500,000.

"This country needs 2,000 aeroplanes for its defense—and it has less than 20 distributed among the Army, Navy and Militia. The Army and Navy programs made public recently provide for the addition of less than 150 aeroplanes. No provision is made to furnish aeroplanes and equipment to the Militia, and the heads of the Militia advise that they have no funds for this purpose.

"We appreciate, of course, that it will be necessary in the near future for Congress to provide for the equipment of the Militia with aeroplanes, but Congress, as you know, moves slowly, and as the need is immediate and imperative, it behooves all of us to coöperate in meeting this need. Trained men are needed, and it takes months to train an aviator or an observer. In case of need today it would be impossible to get trained aviators and observers for 100 aeroplanes.

"We believe that if you will express yourself in favor of organizing an aviation section in connection with the Organized Militia, patriotic citizens will contribute the amount necessary to start an aviation detachment, as was done in New York, Rhode Island and Maine. Twenty thousand dollars was contributed for the Militia of New York and Rhode Island respectively by public spirited citizens and the Chamber of Commerce of Portland is contributing \$10,000 to establish the first unit of the Aero-Radio System of Coast Defense. In all these instances the leading newspapers of the state willingly coöperated in the movement.

"The sum of \$10,000 is sufficient for the acquisition of an aeroplane and the training of four officers to fly, and, being a comparatively small sum, will undoubtedly be subscribed immediately. As already stated, the Executive Board of the Aero Club of America will be glad to give one-tenth of that sum.

"All coastal states should establish a station of the Aero-Radio System of Coast Defense, and it is urged that the first \$10,000 raised for aviation purposes be used for this purpose. As you probably know, Portland, Maine, has taken the initial step toward establishing the first unit of the Aero-Radio System of Coast Defense, and ten other states are considering the plan and may establish other units in the near future. This system of coast defense has been endorsed by President Wilson, Secretary Garrison, Secretary Daniels, and the leading authorities on national defense.

"The Militia, which is the backbone of our defenses, should have aeroplanes. Modern war maneuvers require the use of aircraft for scouting, range finding and various other duties. So long as we have such a very small Army and such a serious shortage of officers and men in the Navy, the Militia will constitute the first line of defense, therefore it is our duty to supply the Militia with modern aeronautical equipment, not only for scouting, but for offense and defense.

"The aeroplane, by reason of its ability to fly over all obstacles at a tremendous speed, starting from battleships or distant bases, has eliminated what, in past wars have been called 'safety zones'—the zone which, while not far distant from the theatre of war, could not be reached by the fighting forces. Aircraft have eliminated these 'safety zones,' therefore plans must be prepared to meet this new factor and to protect life and property in case of need. London is an example of the impossibility of having a safety zone. Although there are hundreds of anti-air craft guns and hundreds of aeroplanes within a radius of 100 miles of London, difficulty still is found in protecting the Metropolis from Zeppelin attacks.

"This war has taught us the lesson that, no matter how far inland from the theatre of war a state may be, its welfare and its very existence depends upon the ability of the Navy and the Naval Militia to protect the shipping of its products to various points, and this in turn depends upon having a well-equipped Navy and Naval Militia to maintain the free-

dom of the high seas, and an efficient and sufficient Army and National Guard to protect inland commerce by preventing invasion.

"We feel sure that the leading newspapers of your state will give you their hearty co-operation in this matter, and that the public in your state will respond as it has done in the states already mentioned.

"Assuring you of the hearty coöperation of the Aero Club of America in anything you may undertake for the benefit of the Militia, and with best wishes for the success of the corps, I am

"Very sincerely yours,

"(Signed) ALAN R. HAWLEY,

"President, Aero Club of America."

### Aeroplanes for the Militia

(Editorial in *Brooklyn Standard Union*)

THE manner in which the Aero Club of America has stimulated interest in the very difficult task of providing the National Guard and the Naval Militia of the various states with flying machines is probably not understood or appreciated as it should be. Twenty-four states have been stirred into working to promote the movement.

In New York aeroplanes have been provided for the Guard and the Naval organizations, but of course they are not yet equipped as they should be. That will be a matter of some years yet, in all probability. Through the activity of the club \$20,000 has been raised in Rhode Island for the Militia, the Wisconsin Guardsmen have been presented with a hydro-aeroplane and something has been done to encourage the development of this branch of the military service in Massachusetts, California, Arizona and Texas.

The important announcement is made that the Aero Club of America will add 10 per cent. to any sum up to \$10,000 raised in any state for aviation purposes. This it is able to do through the generosity of Emerson McMillan, a New York banker.

In the Federal military programme flying machines for the Regular Army are provided, but the Aero Club is not concerned with this. It aims to arouse the public's interest to the point where the people will put their hands in their pockets and contribute to the funds being raised to purchase aeroplanes for the National Guard and Naval Militia. Everybody is invited to help, and as the idea is an excellent one and the plan wholly patriotic there should be a liberal response.

### Aerial Preparedness

(Editorial in *Grand Rapids (Mich.) News*.)

THE Aero Club of America has begun agitation in favor of a preparedness plan that appears to be worth while.

This association, which has assumed leadership in a number of laudable patriotic enterprises, has resolved to concentrate its efforts to establish a chain of aero-radio stations at intervals of 100 miles on the Atlantic, Gulf and Pacific coasts.

Henry A. Wise Wood, who is backing the scheme, points out that an aeroplane equipped with wireless, reporting every hour to a base on shore, could patrol a circle 100 miles in diameter. In that manner a comparatively insignificant number of machines—44, in fact—could protect America from surprises by sea. Such a chain of aero-radio stations, in active operation along the coast of Ireland, could have saved the Lusitania, declares Mr. Wise Wood.

The Aero Club of America is bending every effort toward securing an adequate air fleet for the United States army and navy, and also is seeking to provide such machines for the naval militia and national guard of the various states. America, which gave the world the first practical heavier-than-air machine, has lagged far behind the other nations in the matter of aerial warfare preparedness. The army and navy combined have less than 20 machines. This deplorable condition is shortly to be remedied, for the appropriations prepared for the next congress provide for a sizable equipment, although the proposed appropriations are said not to be as adequate as they should be in order to establish stations in the United States, the Hawaiian islands, Panama and the Philippines. But the nation finally has awakened to its aerial needs, and that is a beginning.



# THE NEWS OF THE WEEK

## Wright Company To Open Winter Aviation School in Georgia

The Wright Company has leased grounds at Augusta, Georgia, for its winter Aviation School.

After an exhaustive search of the South for suitable training grounds, Augusta, Georgia, was finally chosen. This choice was due to Augusta's superior weather conditions, the adaptability of the grounds to aviation as well as their accessibility to the city itself.

The school is already under way with entirely new machines. The services of Messrs. Howard Rinehart and Warren Atwater as instructors, and twenty-five pupils are already installed.

The Dayton factory is engaged in the manufacture of a considerable number of machines for special use at this school. There will be a workshop and assembling plant on the grounds at Augusta, and within the next two weeks there will be accommodations there for 200 pupils.

The school will be conducted on a business basis, with a manager on the grounds, and be in daily communication with the main office in New York.

The pupils will be given a total of five hours instruction on both slow and fast machines, all using the Wright wheel control.

It is a pleasure to note the businesslike way in which this department of the Wright Company is being run, and its results should be most satisfactory for all pupils, as well as for the development of aviation in general in this country.

## First U. S. War Dirigible Under Construction

Work has been begun at the Navy Yard by representatives of the Connecticut Aircraft Company under the direction of Naval experts on the construction of the first American war dirigible designed to carry offensive and defensive weapons. It will be 175 feet long with a diameter of 50 feet. It will have powerful engines and dynamos.

The craft will be equipped with a battery of rapid fire guns. It will carry a score or more of men, with tons of equipment and provisions and is designed to make long voyages. All the latest ideas in aircraft will be adapted to the new airship.

The fact that the report of the Advisory Committee on Aeronautics, transmitted to Congress by President Wilson, has been practically suppressed by refusal of the House to print copies of it, caused something of a stir at the Capitol.

Representative Ernest W. Roberts, of Massachusetts, a member of the House Committee on Naval Affairs, took the matter up with Speaker Champ Clark and was referred to the House Committee on Printing. Representative Henry Barhart, of Indiana, chairman of the Printing Committee, is believed to be standing in the way of printing this document.

## Two New Clubs Affiliate with Aero Club of America

Two new aero clubs have recently been received into affiliation by the Aero Club of America, the Aeronautical Society of California, and the Aero Club of Iowa.

The Aeronautical Society of California has headquarters at the Marsh-Strong Building, Los Angeles, Cal. The officers of the society are: Earle Remington, President; Chas. F. O'Brien, Vice-President; A. H. Rose, Secretary, and A. J. Waters, Treasurer.

The Insignia adopted consists of a shield in red, white and blue, with the words "National Defense" written thereunder.

At a recent meeting of this society a resolution was passed to form and equip, by public subscription, a complete aeroplane squadron for the National Guard of California, and the President, Mr. Remington, was requested to nominate and organize a committee of one hundred prominent business men of Los Angeles to promote and advance this work.

The Aero Club of Iowa has headquarters at Grinnell, Iowa. The officers are: E. B. Brande, President; J. L. Fellows, Vice-President; Harold L. Beyer, Secretary and Treasurer. The Insignia of this club is to be announced shortly.

## An Aero Club for Colorado

Wealthy men of the city of Denver, Colo., have organized the Aero Club of Colorado, which, according to the articles under which it has been incorporated promises to do some large things in the aerial world.

The objects of the club are: The promotion of a patriotic and social club composed solely of the citizens of the United States and of the State of Colorado who are interested in the science of aeronautics; to encourage aerial navigation, expositions, congresses, and contests; to co-operate with and for the benefit of the United States and of Colorado; to lend for their uses the property of the club; to gather data relating to the use of such apparatus.

One of the intentions of the promoters of the club is to organize an aerial corps of the National Guard, to which members of the signal corps will be eligible, and which will use the apparatus provided by the club, and benefit by the course of instruction to be given by a professional, yet to be engaged.

It is planned to buy two machines at once for the use of the corps of the National Guard. One will be a Curtiss grass cutter, and the other will be selected from among the best makes. A licensed pilot will instruct the members of the club and the signal corps how to use the machines.

The membership will be divided into three classes. The first will be participating members, who will assist financially in the purchase of the equipment; the second, active members,

Mr. Clarke Thompson, besides owning a Curtiss flying boat, has been doing extended experimentation in aeronautics in the past few years. He is here shown seated with J. Lansing Callan (on right). Mr. D. S. Norton, who will soon own a flying boat, is standing on the right.







The compression and transverse load tests of engine section of H-4 Curtiss Flying Boat upper plane. A load of 200 pounds was applied endwise and simultaneously 250 pounds transverse to rib without causing permanent set. Both loads were seven times the greatest corresponding stress which occurs in normal flight.

who are interested in the study and practice of aeronautics, especially applied to modern warfare; the third, associate members, who will be expected to contribute to the support, financial and moral of the corps.

Trick flying will be barred and the intention of the promoters of the club is to adapt the most modern machines to military uses.

If the personnel of the first directors of the club may be taken as an index of the character of its membership, it is certain that there will be no money lacking to carry out the club's plans. The directors are all men of large wealth, some of them millionaires. They are Charles K. Boettcher, who has made several ascents in California, Charles Alfred Johnson, J. Foster Symes, Tyson S. Dines, W. N. W. Blayney, Lawrence C. Phipps, Jr., William E. Porter, Harry J. English, Thomas B. Stearns, president of the Chamber of Commerce, Robert R. Hall, Alexis C. Foster and Adj. General Chase.

Charles Alfred Johnson, who is on the retired list of the National Guard, will be the head of the aerial corps with the rank of captain, he having been recalled to the active service by General Chase. Mr. Johnson has left for the East, where he will confer with experts in aeronautics, military and civil, and will inspect the various makes of flying machines.

#### National Guard Unit Making Fine Progress

The Aviation Section of the Signal Corps, National Guard, State of New York, is making fine progress under the direction of Lieut. R. C. Bolling, who is in command. Progress has been greatly advanced through the services of a hired pilot and a hired mechanic. Through their help, it is estimated that the work of the unit has been advanced at least six months.

During November members of the corps made fifty-six flights, and instruction in various details of the work will be continued throughout the winter.

At present the corps is using a hired machine which is satisfactory, but Lieut. Bolling, in a report to Maj. Gen. John F. O'Ryan, advises securing for the detachment a modern up-to-date machine fitted with all appliances which are used in actual service.

Lieut. Bolling favors limiting the instruction of pilots and observers to ten or fifteen men. With the present facilities he observes that this number can be handled better than can a larger class.

#### First of Four Martin Tractors Delivered

The first of four Martin military tractors has been delivered to the government aviation school at San Diego, Cal., and Mr. Glen L. Martin went there to make the acceptance tests. The other hydroaeroplanes which are under contract for the government will be delivered soon. The new machine has a speed of 70 miles an hour.

#### National Advisory Committee for Aeronautics Submits First Annual Report to Congress

The National Advisory Committee for Aeronautics has just submitted its first annual report, with appendices, to Congress. The members of the committee were appointed by the President last April, pursuant to an Act of Congress; and its duties are to supervise and direct the scientific study of the problems of flight, with a view to their practical solution, and to determine the problems which should be experimentally attacked, and to discuss their solution and their application to practical questions.

In the Act establishing the committee, an appropriation of \$5,000 a year for five years was made immediately available. For the first fiscal year the committee reports expenditures of \$3,938.94.

The report states that it is apparent that there is a large amount of important work to be done to place aeronautics on a satisfactory foundation in this country; and that competent engineers and limited facilities are already available, which can be employed by the committee to advantage, provided sufficient funds be placed at its disposal.

The committee submitted a report of considerable value to aeronautics on the behavior of aeroplanes in gusts, as determined by experiments and tests conducted by Naval Constructor J. C. Hunsaker and Prof. E. B. Wilson, of the Massachusetts Institute of Technology. The committee interested the United States Rubber Company in an investigation of balloon and aeroplane fabrics, and through the co-operation of the Navy Department, extensive tests were conducted in the wind tunnel and experimental model basin at the Washington Navy Yard. This co-operation of the Navy Department with the United States Rubber Company yielded very desirable information for aeronautics in general, and shows strongly the advantage of some central authoritative body to co-ordinate the efforts of the Government Departments and manufacturers interested in promoting the science of aeronautics.

Prof. Charles E. Lucke, of Columbia University, was employed by the committee to investigate and report on the thermodynamic efficiency of present types of internal combustion engines for aircraft. His report shows the practical development of the various types of aeronautic motors in use at the present time.

The John A. Roebling's Sons Company contributed a voluntary report on wire terminals, their fastenings and connections. The "Relative Worth of Improvements on Fabricrics" was the subject of a special report by the Goodyear Tire and Rubber Company.

The United States Bureau of Standards prepared a report on the Pitot tube and other forms of anemometers for aeroplanes. The United States Weather Bureau has taken up the problem of the relation of the atmosphere to aeronautics. All of the reports referred to were transmitted to Congress along with the annual report of the committee.

What has already been accomplished by the committee has shown that in order to accomplish all that should be done, the facilities at its disposal will have to be increased. There are many practical problems in aeronautics now in too indefinite a form to enable their solution to be undertaken. The committee finds that one of its first and most important needs is the provision and equipment of a flying field, together with aeroplanes and suitable testing gear for determining the forces acting on full-sized machines in constrained and in free flight. The committee's estimates for next year amount to \$85,000, which contemplate the purchase of proper equipment for the conduct of full-sized experiments, and the development of the necessary technical and operating staff. The committee is impressed with the importance of aircraft to the War and Navy Departments, in view of their utilization in the present war in Europe.

While the needs of aeronautics at present are principally those which have an important bearing on military preparedness, the committee is of the opinion that aeronautics has made such rapid strides that when the present war in Europe is over there will be found available classes of aircraft, and trained personnel for their operation, which will rapidly force aeronautics into commercial fields; so that, any progress that is made in the development of aeronautics for the War and Navy Departments will, in the end, be progress toward an earlier realization of the important commercial possibilities of these craft.



### National Aeroplane Fund

The subscriptions to the National Aeroplane fund from Dec. 11 to Dec. 18, aggregating \$1,245, were as follows: Mrs. Francis A. NacNutt, \$100; Heinrich Schniewind, Jr., \$100; Lloyd Phoenix, \$100; Robert L. Pierrepont, \$100; William A. Read, \$100; C. Oliver, \$100; Charles G. Curtis, \$100; Archibald Rogers, \$50; Paul Moore, \$50; P. H. Jennings, \$50; F. B. Hoffman, \$50; Mrs. Amory R. Lawrence, \$50; Samuel A. Walsh, \$50; F. D. Waterman, \$50; Mrs. William Walter Phelps, \$50; James A. Thomas, \$25; Mrs. Anson W. Burchard, \$25; Guernsey Curran, \$25; John L. Cox, \$25; Mrs. John W. McBurney, \$15; Heth Lorton, \$10; Edmund Wetmore, \$10; J. Clarence Davies, \$10.

### An Aeroplane Cloth of Guaranteed Merit

The Courtrai Manufacturing Company, of 115 Franklin Street, New York, are the sole agents in the United States and Canada for the celebrated Courtrai Pure Irish Linen Aeroplane Cloth, made of the highest grades of flax, specially prepared for Aeroplane service.

This cloth is used by the British, French and now also by the United States Government. This company claim that they are the only company in the business who specialize in Linen Aeroplane Cloth and who stand behind their product, guaranteeing the strength and quality of every yard of material they sell.

In the rapid development of Flying Machines many experiments have to be tried and much material used, that mature experience proves is not suitable for the purpose. Aeroplane manufacturers can eliminate the cost and disappointment of such experiments by using a standardized material which has stood all the tests of such noted flyers as Graham-White, Handley Page, Parnell and many others, and the fact that it is used by the British, French and U. S. Governments is also a guarantee of its merit. Much so called Linen Aeroplane Cloth is offered that is not adapted to the purpose; Courtrai cloth is made for this purpose and this purpose only, namely Aeroplane Machines.

The undernoted records of the different guaranteed strength and specifications of their various grades, will no doubt interest our readers. The largest Aeroplane manufacturers in the United States wrote unsolicited of Courtrai Cloth, "This is the Best Cloth we have ever seen."

No.	Tensile Strength per Inch		Weight per Square Yard	
	Warp	Weft		
1	88.2 lbs.	90.9 lbs.	4 oz.	4 drms.
1R	100.0 "	105.2 "	3 "	13 "
10	120.1 "	147.3 "	4 "	7 "
15	95.8 "	100.0 "	3 "	10 "
9	102.0 "	122.0 "	4 "	..
8	110.2 "	126.2 "	4 "	..

### Thomas School May Move to Florida

With the prospects that the School of Aviation will locate in Florida for the winter months, the students enrolled in the Thomas School are formulating extensive plans for their flying camp. The management of the school has decided to accept only a limited number of students for training so as to make sure that each student enrolled will receive instructions sufficient to allow him to qualify for his license at the camp.

On account of extra equipment necessary to take care of the constantly increasing numbers desiring training, the tuition has been increased. Reservations have been made for thirty, eighteen of which have already been taken.

The equipment consists of one tractor for license work, two land or water machines and four motors. The machines are all equipped with the Dep control, which is recognized as standard by the British government.

With flying every day under the ideal weather conditions of the south, this school promises to meet with considerable favor, especially among the students enrolled from the snow clad plains of Canada, who are all eager and anxious to serve their country by being the "Eye of the Army and Navy."

### Activities at Pensacola Aeronautic Station

During the last week there were 42 hours of flying at the Aeronautic Station, Pensacola, with 2,436 miles of flight. The Torpedo Boat Destroyer Flusser reported at the station for duty on Monday, and is one of the destroyers of the division now stationed at Pensacola for duty in connection with aeronautics. Scouting flights across the Gulf of Mexico with destroyers convoying have been made by Lieuts. Kenneth Whiting and E. W. Spencer, Jr.; First Lieut. A. A. Cunningham, U. S. M. C., and Lieut. A. C. Read, U. S. N.; Lieuts. E. O. McDonnell and G. D. Murray.

These flights were made out of sight of land where there are no landmarks or other aids to navigation, and the courses are made by a compass.

A new Hall-Scott motor has been installed in Aeroplane AH7, and is being daily tested. At the same time aviators are being given instruction in the handling of the Burgess-Dunne type of aeroplane, which is the AH7. Experimental work in photography is being carried out, and a camera suited to the purpose is being developed.

### In Memoriam

We very much regret to learn of the death of Clifford Hulbert Carey, familiarly known amongst his wide circle of aviation friends as "Bud" Carey, which took place on Sunday, December 19th, at his home at Tompkinsville, Staten Island.

The 80 h.p. Le Rhone motored Schmitt Biplane Tractor, P. C. Willman, pilot, and Mrs. A. W. Church, passenger. Mr. Willman piloted the machine from Garden City to his home in Connecticut recently





## THE ROBERTS 100 H. P. CYLINDER MOTOR

**I**N our December 6th issue we carried a description of the Model C twin motor Benoist flying boat which was powered with two Roberts 100 h.p. motors.

The detailed description of the motors which follows has just been received from the manufacturers, The Roberts Motor Mfg. Co., Sandusky, Ohio.

The motor is 5 inches bore, 5 inches stroke and develops 100 h.p. at 1,200 r.p.m.; the manufacturers guarantee the power of the motor.

The propeller regularly furnished with the motor is 8.5 feet by 5.5 feet or 8 feet by 6 feet, either Paragon or Excelsior.

The propellers used with the Benoist outfit were 9-ft. diameter and 6-ft. pitch. The manufacturers guarantee that the motor, when well run in and freed up, will drive the propeller at an average speed of 1,200 to 1,250 r.p.m.

The motor weighs 350 lbs. The radiator which is furnished with it is the well-known Ideal cellular type, which the Roberts people find not only more efficient than any other with which they have had experience, but lighter in weight and stronger at the same time. A 24 by 36 radiator is supplied as standard with the 100 h.p., this weighing only 44 pounds.

The motor, as will be seen, is extremely simple, the only moving parts being the pistons, connecting rods and crankshaft. There are no valves or cams or camshafts, springs, push rods or any other delicate working parts; the only gears on the motor are those used for the magneto and pump drive.

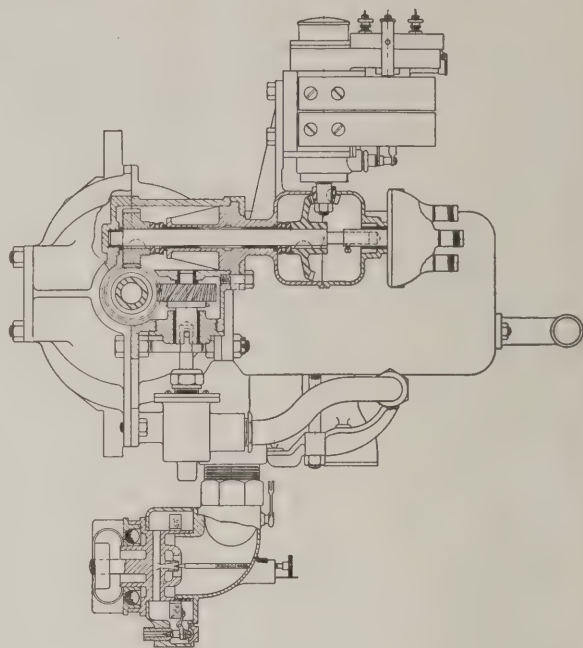
The motor is exceedingly compact, measuring only 49 inches in length over all, the base being only 14 inches in width and the height above the center line of the crankshaft being only 20 inches.

There are so few working parts in the motor that the manufacturers are enabled to make the working parts exceptionally liberal in size. They claim that the bearings and crankshaft are 50 to 75 per cent. larger than in any other motor of the same power.

The cylinders are special grey iron castings, with the water jackets integral and are machined all over. The pistons are of aluminum alloy and there are three one-piece rings to each piston. Connecting rods and crankshafts are drop forged vanadium steel, the crankshaft is  $2\frac{1}{2}$  diameter, bored hollow for lightness in weight.

There are seven main crankshaft bearings, the bearings between each crankcase section being  $2\frac{1}{2}$  by  $2\frac{1}{2}$ . On the magneto and of the motor the bearings is 4 by  $2\frac{1}{2}$ , while on the propeller end the bearing is 6 by  $2\frac{1}{2}$ . The connecting rod bearings are  $1\frac{3}{4}$  by  $2\frac{1}{2}$ ; all bearings are of a special high-grade die cast nickel babbitt.

The propeller end bearing is not only unusually liberal as to size, but is further reinforced by a combination radial and lateral thrust bearing at each end. These bearings carry the



entire load of the propeller so that the crankshaft bearings are not called upon to assume any part of this strain.

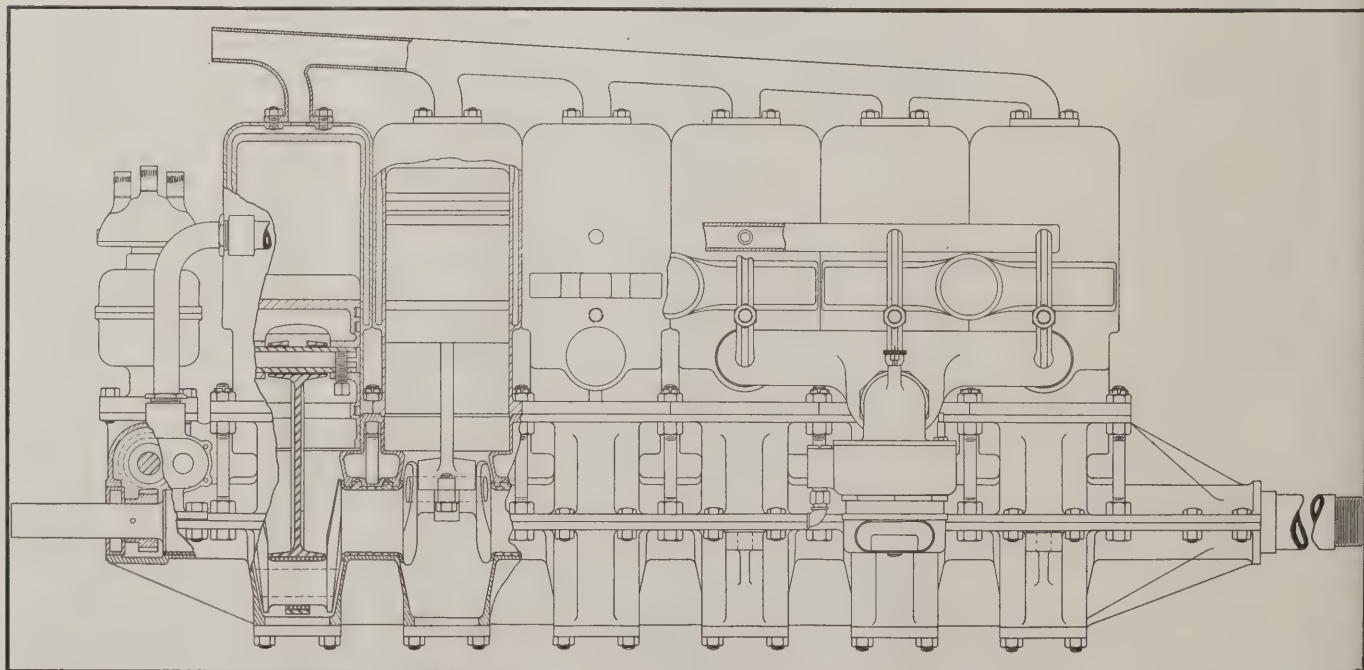
The motor is fitted with two 2-inch Planhard carburetors, one carburetor connected to each set of three cylinders by an aluminum manifold which is finished all over. This allows an individual adjustment of each carburetor to its set of three cylinders, the throttles of the carburetors being operated by a common lever.

Ignition is furnished by a Bosch magneto; two magnetos can be supplied if desired, as the cylinders are tapped for receiving two spark plugs.

The method of magneto drive is especially noteworthy, the magneto being rotated bodily to secure the spark advance and retard. Through this means the armature of the magneto is advanced rather than the distributor and the same hot intense spark is thus secured at all speeds.

Every engineer knows that in the ordinary method of securing advance and retard by changing the position of the magneto distributor, the spark is hottest at full advance, and

*(Continued on next page)*



The Roberts "Twelve"



# FURTHER DEVELOPMENTS OF MILITIA AERO CORPS

## \$20,000 Being Raised for Missouri National Guard Aeroplanes

Two aeroplanes, one to be used to train members of the Missouri Naval Reserves and the other to train members of the Missouri National Guard, will be bought with a fund that is being raised by popular subscription by the Missouri State Aeronautical Society.

This organization, although it has been in existence only a month, has started to raise the \$20,000 needed, and in three days last week \$1,000 was raised in St. Louis.

As the movement is State-wide, subscriptions will be sought in all parts of the State.

The society has the indorsement of Secretary of the Navy Daniels, Admiral Benson, Captain Mark Bristol, the Aero Club of America and the Navy League of the United States. Albert Bond Lambert is president of the Missouri society, and H. W. Johnson is secretary. The members of the Advisory Board are Charles Nagel, Benjamin Gratz, Peyton T. Carr, Philip B. Fouke, Charles Claflin Allen, H. W. Eddy, Dan. C. Nugent, and W. B. Strang, of Kansas City.

The plan is to buy two machines and establish hangars for them. The one for the Navy branch would be installed at a point on the river front as near the Chain of Rocks as possible. The other would be established either in Forest Park or at the rifle range at St. Charles. As soon as a corps of the First Regiment is trained it is planned to move the machine to Kansas City and train another corps in other regiments.

## Government To Provide Craft Later

The War or Navy departments will supply the necessary machines for the Naval Reserves or the National Guard when-trained aeronauts are ready to manipulate them.

Mr. Lambert said that it had been proven in the present war that the aeroplane is the eye for both the navy and army, and that in time of war a trained aeronautical corps is of inestimable value. Twenty-three States have taken up the work of raising funds for the purpose of supplying machines. The cost is about \$7,500 each.

The headquarters of the Missouri State Aeronautical Society is at 2001 Locust street.

## Florida Wants Aeroplanes

The Florida Naval Militia, particularly the First Battalion, is very much interested in developing aviation corps, as is shown in an interesting letter from Lieut. Almour, who has been appointed by the Lieut.-Commander of the Militia to take up the matter:

KEY WEST, FLA.

Mr. Alan R. Hawley, President,  
Aero Club of America,  
New York City.

Dear Sir: Having been detailed by Lieut.-Commander George B. Graham, commanding First Battalion, Florida Naval Militia, to take up the matter of an aeronautic section for that organization, I respectfully request your advice and assistance so far as you may be able to give it.

I am deeply interested in the matter personally, and have had some training which I think would greatly aid me in qualifying for practical work in this line. I was chief electrician (radio) in the regular Navy, in which I served eight years; have been an officer in the Naval Militia more than two years, and have for some time been a student in aeronautics, with such facilities in the way of books and periodicals as I have been able to procure.

I note in an article in AERIAL AGE that it is proposed to establish a series of coast patrol stations, or zones, of which Florida, on account of its extensive sea coast, should have nine.

If this plan is to be carried out, and the proposition financed by private subscriptions, it is evident that Florida will have to have assistance from the other states. While the larger cities, like Jacksonville, Tampa and Pensacola, may be able to finance their local stations, Key West, being a small community, and having experienced a business depression even more marked than that felt by other sections of the country, could hardly do very much in that direction.

Still, Key West, being the strategic key to the Gulf of Mexico, ought, in our opinion, be one of the most important stations.

We have the spirit and willingness to do our part in this great work provided your club or other patriotic societies can help us to secure the desired equipment.

There is a splendid military spirit among our people, as may be judged by the fact that this small city of 20,000, situated on an island away out in the Gulf, maintains a Battalion of two divisions of Naval Militia and one Infantry company of the National Guard.

I would be very glad to have a personal letter from you, with any advice you may be able to give, and wish to have my name and that of this organization placed on file for the purpose of being in line to take up the work should you at any time be able to assist us in effecting a practical organization.

We have been receiving some literature from your Club and have had a number of articles concerning the movement published in the local newspapers.

Assuring you in advance of my appreciation of any consideration you may show us in this matter, I am

(Signed) Very respectfully,  
GEO. W. ALMOUR,  
Lieutenant, Florida Naval Militia.

## Lincoln to Omaha in 43 Minutes

Capt. R. E. McMillen, of the aeroplane corps of the Nebraska National Guard, made a trip on November 21 from Lincoln to Omaha in 43 minutes. The trip was made as a part of a theoretical military campaign and was to have included a series of bomb droppings at specified points, but the latter experiments were omitted on account of the intense cold. Capt. McMillen left Lincoln at 2:34 and arrived in Omaha at 4:12 p. m. after a stop of 55 minutes at Ashland. The aeroplane was preceded by several aeroplanes, including one which carried General Hall and his father, Dr. P. L. Hall, J. H. Hansen and William Baxter.

The trip was in every way satisfactory to the officers of the National Guard, notwithstanding the fact that weather conditions were not ideal. A northwest wind blowing at the rate of twenty miles an hour hampered progress, and the cold limited the scope of operations that had been laid out for the aviator, but as a demonstration of the wide range of usefulness of an aeroplane in military service the flight was a complete success. Among the many letters and packages which Capt. McMillen carried was a message from Governor Morehead to Mayor Dahlgren, in which the Governor said:

## The Roberts 100 H. P. Cylinder Motor

(Continued from preceding page)

when retarded from this position, loses its efficiency and strength.

This method of attaching the magneto to the Roberts motor is one explanation of its remarkable easy starting qualities.

This new Roberts motor has been very successful in the past season, having been used in a number of exhibition and passenger-carrying craft.

In a Benoist passenger-carrying flying boat the motor set up what is believed to be a record for a 100 h.p. outfit, turning an 8.6-ft. by 5.6-ft. propeller at an average speed of 1,250 r.p.m., giving the flying boat a speed of 70 miles per hour, carrying the aviator and one passenger.

The outfit complete ready for flight weighs close to 1,900 pounds, and the machine had a spread of about 40 feet, about 600 feet total lifting surface.

The Roberts Company claim the motor can be operated in continuous service at least one hundred hours without requiring overhauling or adjustment, and owing to the fact that there are no valves to give trouble, no cams, springs or push rods to wear, the overhauling required is extremely superficial.

Owing to the simplicity of the motor the manufacturers say that it is the easiest engine to adjust or to overhaul there is on the market, and that anyone of ordinary mechanical knowledge or skill can not only operate the motor, getting perfect satisfaction from it, but can keep it in constant good running trim, without an unusual amount of labor; no specially trained mechanic is needed.

The motor is practically automatic in operation and needs absolutely no attention after started, the lubrication being accomplished through the fuel, so that this point, which is usually troublesome and the subject of worry with a mechanical lubricating system, is perfectly taken care of by natural means in the Roberts motor.



## THE NEW STURTEVANT BATTLEPLANE

ON Dec. 12th remarkable flights made at Readville, Mass., one of the U. S. Army expert aviators, revealed to the public for the first time that a notable development in aviation had quietly been made by the Sturtevant Aeroplane Company under the direction of Mr. Grover C. Loening, B.Sc., M. A., C. E., former Aeronautic Engineer of the U. S. Army, author of "Military Aeroplanes" and other important technical works.

Ever since the war began aeroplane constructors all over the world have been exerting their best resourcefulness in designing new means for making aeroplanes more and more effective as fighting machines. Induced by the new conditions that had to be met, the aeroplane gradually became more powerful and larger in size, but the general trend consisted in forcing a small sized aeroplane into a larger and often awkward form, by merely adding more motors or extending its wings by adding additional sections.

Realizing the necessity of abandoning the structural details and ideas of small machines and to design large ones as units in themselves, Mr. Loening and his associates undertook to produce a machine on a principle which permits the construction of large aeroplanes with a maximum of efficiency and simplicity.

As the accompanying illustrations show the Sturtevant Battleplane is a biplane of tractor type built with remarkable simplicity and with studied attention to efficiency.

There are many novel features, including the steel construction, the placing of gun turrets on either side of the central body, the elimination of wires, the general streamline construction which has been carried as far as to having even the cables and turnbuckles in streamline. The span of the machine is 50 feet, the length 25 feet; it has a total area of 700 square feet of wing surface.

It is interesting to note that the machine was completely designed before construction, and extensive aerodynamic tests were made of the model of this machine by Naval Constructor Jerome C. Hunsaker, in charge of the Aeronautical Engineering course at the Massachusetts Institute of Technology, which gave excellent information on the stability and controllability of the machine. Constructed as designed the machine actually did more than was anticipated.

In the Sturtevant Battleplane the single motor tractor that has been puzzling aviation experts is made into a simple, effective fighter, by the novel idea of placing a gun turret on either side of the body, as shown in the illustrations, a development which, though obviously simple, nevertheless required considerable effort to work out satisfactorily. These gun turrets in each of which a gunner observer is located are placed out on the wings, with an excellent clear view ahead and below and a range for gun fire on all sides, with the added advantage that two guns can be concentrated forward with deadly effect. In addition to that a broadside of both guns can be obtained by tilting the machine laterally, a feature, which for a long time escaped attention of aviation experts.



It is true that in the two motor machines there is a small degree of safety in having one motor still running when the other has been hit, so it is equally true that in the new Sturtevant Battleplane a gunner is still hitting away when the other has been disabled.

Perhaps the most important feature of this new Battleplane is that unlike some of the fighters being used at the front now, this machine is an extremely good flyer, so much so that despite its huge size and great weight the most difficult manoeuvres, including looping and side tumbling, have actually been performed with this machine to the satisfaction of expert flyers.

Due to the better load distribution the safety factor of this new machine has been shown by tests to be 12 times the flying load. Another feature which is novel is that the gun



Front view of the Sturtevant battleplane showing the arrangement of the gun turret.



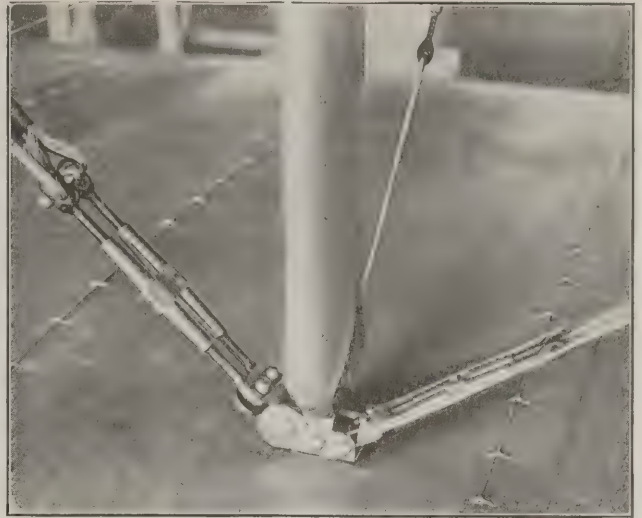
turrets are readily removable, so that by decreasing the head resistance and the load, the same machine is interchangeable into a high speed, scouting type with great excess power for climbing and cruising radius of over 500 miles.

Very little data on the performances of this machine are disclosed by the manufacturer, but it is said to have a gasoline capacity of almost 150 gallons, sufficient for 12 hours' flight and to carry a total live load of over 1,200 pounds. The efficiency of this new machine is said to be considerably higher than has been previously attained in this country, due to having all the wires and fittings "streamlined" (made torpedo shape to reduce head resistance). This, however, is a development that has come to be standard practice abroad.

It is interesting to note that the gun turrets could be used for carrying mail and measuring 2 feet wide by 7 feet long, they could carry over 24 cubic feet of mail. One of the most novel features in the construction of this new craft is the use of a new type of vanadium steel construction, lighter than wood, more durable, fireproof, and capable of being extended into aeroplanes ten times the size of this huge bird.

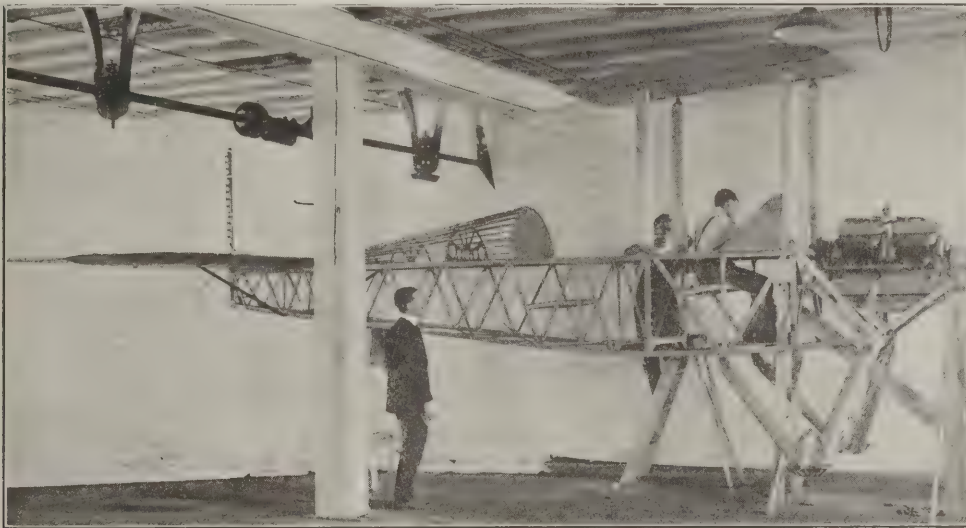
It is said that this construction is to be disclosed to a committee of experts in the near future.

Several hundred pounds of bombs can be carried on this new fighting flyer and with its gunners to ward off other aeroplanes, these destructive missiles could be dropped with impunity on a helpless city. There is little doubt that large squadrons of craft of this kind could paralyze a nation's industry and from what has already been done in Europe and the indications of what is coming it is reasonable to predict that the colossal war in Europe will end in the air—



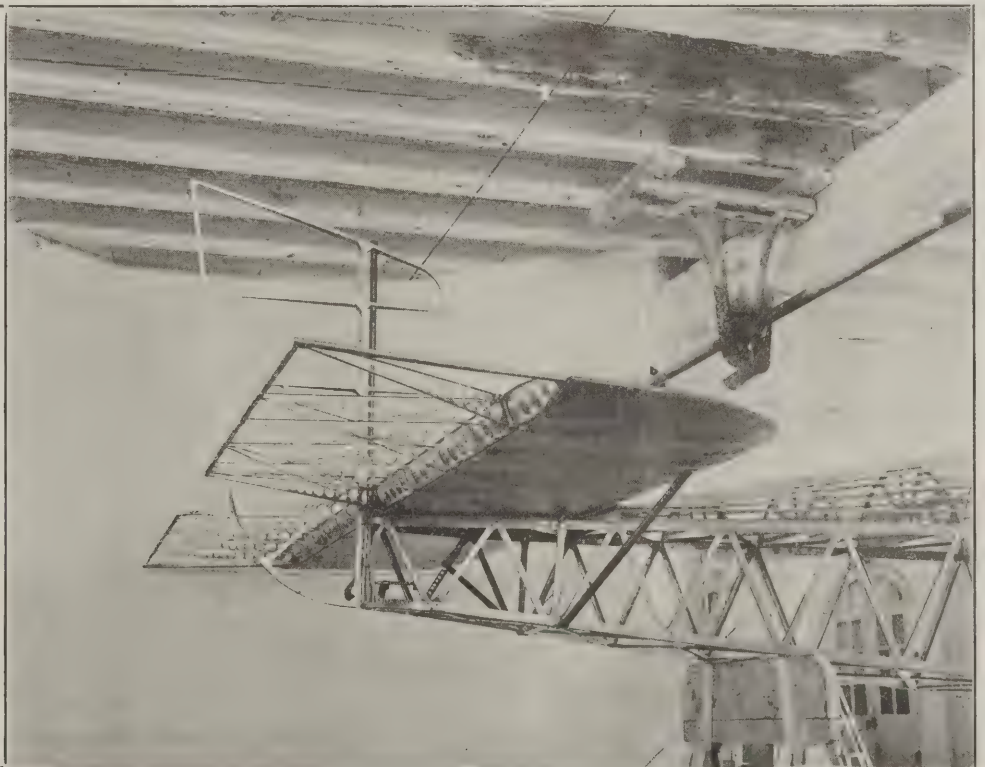
in tremendous battles of huge air navies engaged in the destruction of cities, railroads and even Armies.

While the Sturtevant Battleplane is but a step in the development of these mighty fleets, it is a remarkable indication of the trend of aeroplane progress and more important than all it has been designed primarily for Uncle Sam.



Showing steel construction of the fusilage

Showing the peculiar construction of the elevator flaps and rudder







# FOREIGN NEWS



## AUSTRIA.

An Austrian aerial squadron bombarded the stations of Antonowka and Klewa on the Miedwieze-Sarny Railway, on the Russian front, causing a fire at Klewa. The squadron returned safely. South of Olyka an enemy aviator was forced to descend and was captured.

## FRANCE.

French aviators made many flights on Dec. 14, in pursuit of German aviators. One aviator made at attack below Schlattstadt, Alsace, on a German machine, which was put to rout. Two others engaged in combat three Albatrosses within the German lines in the Artois. One Albatross was compelled to land.

At about the same time a French squadron in conjunction with British aviators, bombarded the aviation field of the Germans at Hervilly, in the Somme.

A squadron of thirteen French aeroplanes bombarded the German aviation camp at Habsheim, to the east of Millhausen. Shells were dropped on the hangars. Of the fifteen enemy machines, which chanced to be on the ground at the moment of the bombardment, five immediately took the air, but their chase was ineffective.

Lieut. Caudron and his brother, a well known French aeroplane inventor, with their engineer and mechanic, were instantly killed on Dec. 13 in the Bron aerodrome. A new machine designed to carry several persons capsized at a great height.

A Zeppelin, headed for Ypres with a cargo of bombs, suddenly exploded near Namur and the entire crew was killed. Three peasants working in nearby fields were arrested and sent to Germany in an effort to keep the accident a secret.

Two French aeroplanes dropped a score of shells of large calibre on Le Sablon railway station, two miles south of Metz.

There is being organized at Neuilly an American aerial squadron of fifty aeroplanes. Launched a month ago, the project is progressing so well, a late cable says, that most of the money required has already been pledged. The promoters of the squadron hope to have all of the funds subscribed by Americans, all of the machines made in America and all of the men in the corps to be Americans. Many volunteers are forthcoming and to encourage the project the government has ordered all commanders to transfer from other commands, upon their own request, Americans who desire to enter the American flying corps.

## GERMANY.

The German War Office claims that four Allied aeroplanes have been brought down within a few days. The official bulletin, issued on the 14th inst., says: "The Allies who dispatched several aeroplane squadrons to Bapaume and Peronne, to Lorraine and to Mullheim, in Baden, lost in aerial engagements and under the fire of our anti-aircraft guns four aeroplanes, including one high-power aeroplane with two motors." The British official bulletin, however, declares that this German claim is untrue.

"Lieut. Immelmann on Dec. 15, caused an English monoplane to fall over Valenciennes after an aerial battle.

"The aim of the aeroplane attack on Muelheim, Baden, was, according to the French, the railway establishment in that town. None of the bombs which the French dropped fell in the neighborhood of these buildings. One civilian was killed and another injured in the town.

Eight members of the crew of a Zeppelin which raided London on Oct. 13, were found frozen to death on the return of the dirigible to Germany, according to the London Express. That Journal claims that the tragedy has been openly discussed in Germany and ventures the opinion that the disaster has acted as a deterrent to further raids.

Through Copenhagen there comes a report to the effect that a giant Zeppelin, L-22, one of the latest of the big dirigibles, had been destroyed through the accidental explosion of a bomb as the airship was being taken from its shed. Nearly all of the crew of forty were either killed or injured. The dirigible, which was one of the so-called "superzeppelin" type of air cruisers, had the "invisible" gondolas, gun platforms on the top of the envelope and rafts for use in emergency at sea, which are the accompaniments of the latest German air craft. The Stiftstidende of Ribe, Denmark, announces that three Zeppelins had been destroyed in Germany in the month of November, the Z-19, the Z-28 and a third the designation of which was not known.

## GREAT BRITAIN.

That the air peril still worries London is evident from the number of inquiries recently made in the House of Commons. A volley of questions were directed against the representatives of the Admiralty. The opening question was: "Can the Admiralty, with a view of reassuring public opinion, state whether the provisions for the anti-aircraft defense of London and the eastern counties have been proved to be satisfactory?"

Thomas J. Macnamara, Financial Secretary of the Admiralty, replied that he could add nothing to the statements already made. In answer to a question regarding the status of Rear Admiral Sir Percy Scott, Mr. Macnamara said that he was still in charge of the gunnery defenses of London, but that the transfer of the guns to the War Office was expected soon, and Sir Percy's continuance in that work would then be a question for examination.

Mr. Macnamara said he could not make a fuller statement regarding impending changes in the personnel of the anti-aircraft service. He also declined to answer a question as to whether there had been seven or eight abortive Zeppelin raids since Oct. 13.

In one official statement issued from army headquarters last week ten aerial engagements were reported. An enemy airship was forced down within its own lines and an Allied aeroplane was forced down within its own lines.

Capt. Smith, of the Royal Flying Corps, was burned to death while flying an aeroplane at Farnborough. The machine suddenly burst into flames and Capt. Smith succumbed before he could bring the machine to earth.

British airmen pursued and destroyed a large German seaplane off the Belgian coast on the afternoon of Dec. 15, in a spectacular engagement which ended in the sudden disappearance of both the German machine and its occupants beneath the waves.

Flight Sub-Lieut. Graham, in an aeroplane with Flight Sub-Lieut. Ince as observer, were on patrol off the coast when they sighted the German. After a severe engagement the German machine was hit and fell. Before reaching the water it burst into flame, and at the moment of striking exploded. No trace of the pilot, passenger or machine could be found. The British craft was severely damaged by machine gun fire and fell into the sea, but both the officers were picked up and safely landed.



Above the Russian Lines in Poland. These Clouds Screened the German Aviation Scout Who Took the Photograph.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

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**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### How to Construct and Fly Model Aeroplanes\*

BY GEORGE A. CAVANAGH.

#### Propellers:

Propellers may be cut from various kinds of wood, but the most suitable for model propeller construction is that of white pine. From this kind of wood propellers may be cut in less time and are lighter in weight than propellers made from other kinds of wood and when treated with a varnish are sufficiently strong for flying. In selecting wood for propellers be sure and see that it is free from knots, holes and other imperfections and is of straight grain. When such wood has been obtained, cut out a piece 8 inches long, 1 inch wide and  $\frac{3}{4}$ ths of an inch thick, and mark one side TOP. Then cut out a diagram of a propeller similar to Fig. 1, lay it on the piece of wood and draw a line around it until the same diagram appears on the block of wood, after which find the exact center of the block by drawing two lines from the four corners of the block in such manner that the cross is exactly in the center. This may also be done on the BOTTOM of the block. Now bore a hole  $\frac{3}{32}$ nds of an inch in diameter through the center of the block, through which the propeller shaft is inserted when the propeller is finished. Next, mark on one side of the diagram on TOP of the block, Blade 1, and on the other side, Blade 2, then cut out the blank following the outline of the propeller. In cutting out the propeller, hold Blade 1 in the left hand and a jackknife in the other; place the blade of the knife on the STRAIGHT edge of Blade 1, and cut away until the line shown in Fig. 2 has been reached, then sandpaper this blade a little until a small curve is obtained by which the propeller grips the air. To cut out Blade 2, hold Blade 1 in the left hand and cut away until the line in Fig. 3 is reached. This is sandpapered in the same manner as Blade 1. It must be remembered that during these operations the TOP of the blank is always up and the cutting is done on the STRAIGHT lines. The reason for this is that should the straight edge be cut on one side and the curved edge on the other, the blades of the propeller will have a tendency to push in opposite directions and in consequence there will be no propulsion. The back of the propeller blanks are next to be cut, the manner of cutting being the same, only that instead of cutting along the straight lines the cutting is done along the CURVED lines. In cutting down the back of the blank, the model builder must exercise careful judgment for one stroke of the knife too much may result in putting a hole in the propeller blade. A good way to determine the thickness of the blades is to hold the propeller up to the light occasionally; thus the heavy and light parts of the blade may be seen. After the backs of the blades have been cut down they may be made smooth by sandpapering. Now the second propeller is cut and finished in the same manner, but the diagram to be used is that of Fig. 4. Thus both propellers are cut to revolve in opposite directions for if both are cut to revolve in the same direction the torque of both combined will be great enough to overturn the model.

When both propellers have been cut and made smooth, a heavy coat of shellac may be added, after which they should be put aside to dry until ready to use.

The wings of the model will be described in the article which will follow in our next issue.

\* In response to numerous inquiries from boys in all parts of the country interested in the science and sport of model construction and flying, Mr. Cavanagh will present in this and subsequent issues of Aerial Age, non-technical descriptions of how the various parts of a model aeroplane are made, and when made, how the whole is assembled.

#### Illinois Model Aero Club

WARD PEASE

On Friday evening, December 17, the semi-annual election of officers was held. The new officers enter upon their duties the first of the year and they are already making plans for future activities which will make the year of 1916 a greater year for the Illinois Model Aero Club than any former year has been.

Mr. Hitt, who was elected president, has been active in club affairs for several years and his election comes as a natural result of the services he has rendered the club in the past. The officers elected were: President, Willis Hitt; vice-president, Joseph J. Lucas; second vice-president, C. R. Borkland; secretary, Ward Pease; treasurer, Harry Wells; chairman of the Contest Committee, Ellis Cook; chairman of the Membership Committee, J. T. Carleton; chairman of the Social Activities Committee, A. E. Nealy; publicity official, A. E. Nealy.

Figure 1.



Figure 3.

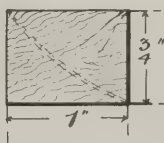


Figure 2.

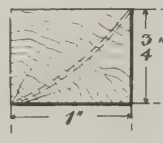


Figure 4.







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Citing a Case

"Work as we will, we can't excel Nature."  
 "Oh, I don't know. A monoplane can fly upside down. Ever see a bird do that?"

She—Pa says we can take his machine to elope in if you'll pay for the gasoline.

He—Huh! I knew there was some string to it.

#### Hadn't Bargained for That

"I thought I was taking an examination for the railway mail service?"

"You are," said the examiner, "you are."

"They ask me how far it is from the earth to the moon."

"What of that?"

"Well," said the candidate, "I hadn't figured on taking an airship run."

#### A Country Editor Wrote:

"Brother, don't stop your paper just because you don't agree with the editor. The last cabbage you sent us didn't agree with us either, but we didn't drop you from our subscription list on that account."—*Boston Transcript*.

An Irish aeronaut, direct from Dublin, met one of his countrymen who had been in the trenches for several months. The latter was an awful sight and nearly unrecognizable. He was leaning on his new friend.

N. F.—"Parlez vous francais?"

No answer.

N. F.—"Uh-h, Sprechen Sie Deutsch?"

Still silence.

N. F.—"Must be Roosian. Speakiteasky Rutovisky?"

No reply, whatsoever.

N. F.—"Well, you might be a Turk or an Indian or most anything, but I'm d—d if I'll strangle meself any more fer the king hisself."



**HAPPY ARTHUR:** "An' y'ackshally 'ear some fellers talk abaht the good old-fashioned Christmas!"—[Courtesy Flight]

The pilot and passenger decided to sleep in the balloon shed over night. During the night, however, the pilot was awakened by escaping gas.

"Bill," shouted the pilot.

Bill snored a bit louder and turned over.

"Bill," said the pilot with increased emphasis.

"What is it?" grunted Bill.

"Get up; the gas is leaking."

"Aw, put a pan under it and go back to bed."

#### Got Satisfaction, All Right

An aviator was arrested for landing upon the park lawn, whereupon he became angry and called the policeman an ass. After he had paid his fine the Judge reproved him for what he had said to the officer.

"Then I musn't call a policeman an ass," he said.

"Certainly not," said the Judge, "you must not insult the police."

"But you wouldn't mind if I called an ass a policeman, would you?"

"Why no, if it gives you any satisfaction," answered His Honor with a smile.

The aviator turned to the man who had arrested him. "Good-day" policeman," he said, and immediately left the courtroom.

Tim—Taking a wife is a good deal like buying an aeroplane.

Tom—How so?

Tim—Well, the accessories make the major portion of the cost.—*Judge*.



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Mr. Henry A. Wise Wood resigns from Naval Consulting Board

IT was inevitable that Mr. Henry A. Wise Wood, Vice-President of the Aero Club of America and Chairman of the Conference Committee on National Preparedness, should find it necessary to resign from the Naval Consulting Board, for Mr. Wood is one of those men who take the welfare of his country seriously, regardless of political affiliations or personal costs.

Last winter Mr. Daniels induced a conference committee in Congress to slaughter a Senate amendment to the naval appropriation bill which provided for the creation of something like a Naval General Staff. He hypercritically explained his opposition to a General Staff on the ground that he could not approve the establishment of such a substitute body without wounding the feelings of the members of the General Board. This solicitude was suspicious, since in his annual report of December, 1914, the Secretary did not hesitate to turn down the General Board's recommendations all along the line. If he had been franker he would have said that he preferred a General Board to a General Staff, because the former has no status under the law and is merely a department agency, whose advice he can suppress whenever he pleases, while a General Staff, created by law, would be entitled to express its opinions to Congress and have these opinions go to Congress and the public unedited.

Mr. Daniels played the General Board a shabby trick this year. He gave out his own report for publication two weeks in advance of the board's report. He referred in his report to a five-year building program prepared by the board, which, he said, was substantially the same as his own five-year building program. He thus sought to spread the idea that the board agreed with him, except in a few minor details. Yet the board's report shows that this agreement was obtained only because the Secretary had carefully limited the board to reporting a program involving exactly the same expenditure as he had already determined to allow for the period covered.

When Secretary Daniels, representing the Administration, allowed such men as William Jennings Bryan and Claude Kitchin to dictate his policy and thereby jeopardize the safety of the country by changing the program of the experts, it could not be expected that, knowing about this attitude of the Secretary of the Navy, Mr. Wood should remain in the Naval Consulting Board.

In taking this patriotic action Mr. Wood is demonstrating that he is imbued with the same spirit which has characterized the Wood family for so long. Mr. Wood's ancestors came to this country in 1637. Eight brothers of the Wood family entered the American Army during the Revolution and four were killed in the battle of Germantown.

In his letter of resignation Mr. Wood makes it plain that the policy of the Administration, in substituting civilian judgment for the scientific conclusions of the General Board of the Navy and the General Staff of the Army is repugnant to him and inimical to the safety of the nation, and in a few brief sentences he reduces the whole question of preparedness to a simple proposition.

Mr. Wood says he will continue to give the government the benefit of his knowledge, but he severs his official connection with the Administration so that he shall be free to prosecute without restraint his campaign for adequate preparedness.

Mr. Wood's letter follows:

December 22, 1915.

HONORABLE JOSEPHUS DANIELS,  
Secretary of the Navy,  
Washington, D. C.

My dear Mr. Daniels:

I beg to inform you that with profound regret I have this day sent to Mr. Edison and to the American Society of Aeronautic Engineers, whose appointee I am, my resignation as a member of the Naval Consulting Board.

I have done this in order that I shall be free to attack the thoroughly inadequate and therefore dangerously weak Naval and Military policy of the President, as expressed in Secretary Garrison's and your own recommendations, and to urge publicly that the recommendations of the General Board of the Navy and General Staff of the Army, as contained in their original reports, be submitted therefor.

If our homes, our people, our institutions, and our rights are worthy of preservation at all they are entitled to the most impregnable safeguards which trained men can devise and our enormous wealth create, and their safety should not be jeopardized by such dangerous political expedients as, in lieu of adequate defensive establishments, a perusal of the reports of the General Staff and the General Board will prove the Naval and Military plans offered us by the Administration to be.

Where the General Board recommends that our Navy be made the equal of the most powerful in the world by 1925, and offers a program for 1917—withheld by you from the public—which the board says will accomplish this if continued in subsequent years on a similar scale, you have arbitrarily limited the board to a given sum for new construction, and thus have forced it to substitute for this a program which in reality is not its own but that of yourself, a civilian, who as such is wholly incompetent to judge how large or of what our Naval forces should be. Furthermore, even this restricted program which you have forced from the board you have further weakened by eliminating from its first year two dreadnoughts and one battle cruiser.

Likewise, the Secretary of War, notwithstanding his often expressed deep interest in preparedness, has not had the courage to support the recommendations of the General Staff of the Army. The staff consists of our mostly highly trained experts, yet he, also merely a civilian, has cut its recommendations to pieces. Instead the Secretary has presented what is little more than an emasculated ghost of the staff's plan for an adequate regular Army. He proposes to leave the country with a mobile Army of but 50,000 regulars in addition to the immobile garrisons of our harbor forts with which to hold in check an invasion, should it occur, until such civilian and semi-military forces as we may have shall have been brought to fighting efficiency—a matter of many months. This, notwithstanding the General Staff's statement that one nation can deliver upon our Atlantic coast 827,000 troops in

**America Must be Given a Navy Equal to the Best.** If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.



46 days, and another upon our Pacific Coast 238,000 troops in 63 days.

Thus, the Administration offers us neither enough strength at sea to resist thereon the fleets of the foremost powers, nor enough strength ashore to prevent the successful landing of the armies of such nations, for which their superior navies could easily clear the way. If this be the President's brand of patriotism, it certainly is not mine.

In terminating my official connection with your Department I wish to acknowledge the possession of a warm personal attachment for yourself which has made extremely difficult the performance of this unpleasant duty, and to express my profound regret that I shall no longer be part of that magnificent technical body of whose creation soon you will have so much reason to be proud. Although I shall have ceased to be officially connected with the latter, I shall nevertheless faithfully labor on its behalf as a consultant to those of its members who represent the American Society of Aeronautic Engineers.

Respectfully,  
(Signed) HENRY A. WISE WOOD.

### Curtiss Company Gets \$15,000,000 Contract.

WE have in the past given substantial hints of the tremendous orders for aeroplanes placed with some of our manufacturers. We take pleasure in giving a summary of the business on hand of the Curtiss Aeroplane Co. which has been figured out by one of the experts of Wall Street, undoubtedly from the figures available in Wall Street, where the bills are paid. A recent issue of the *Wall Street Journal* gives the following resume of the business of the Curtiss Co.:

"The Curtiss Aeroplane Co. has closed a contract with the British government for \$15,000,000 worth of aeroplanes.

"In the fiscal year ended October 31, last, the Curtiss Co. produced over \$6,000,000 worth of aeroplanes and motors, most of which went to the British government.

"On the year's business the company showed profits of \$2,500,000. In the current fiscal year to end October 31, 1916, profits are expected to be between \$7,000,000 and \$8,000,000. The company will ship in the next ninety days four hundred 160-horsepower motors to England for installation in planes for use of the English aviation corps.

"At its Buffalo plant, which is said to be the largest aeroplane plant in the world, the company has in the past year been developing more efficient motors and shipping completed aeroplanes abroad on order of the British government.

"Prior to the war essential steels for construction of motors, etc., was secured abroad and when the war cut off the German supply, not a little difficulty was encountered in securing American steel to fill the requirements. This difficulty has, however, been solved and the Midvale and Driggs-Seabury companies are supplying a quality of steel that meets all tests of the foreign product. In fact, the only foreign material on the Curtiss aeroplane as now produced is the Irish linen which is used as wing covering.

"It has been said that America has so far not been able to produce an efficient aeroplane motor or one that could comparably measure up with those manufactured abroad, but apparently Curtiss has developed a motor well up to the best of foreign makes, as is evidenced by the big orders received from the British government.

"The Curtiss Co. has just developed a 320-horsepower motor that has stood up under the most exhaustive tests of the British engineers who inspected the machines at the company's plant. His standard 160-horsepower motors will, however, be used in a veritable dreadnaught of the air which is now under construction by the company. The size and carrying capacity of the aeroplane is limited only by the power of the motors. As many planes as necessary can be added to the aeroplanes, provided the motors are powerful enough to drive it on continuous load.

"The immense machine under construction will have three planes and a spread of 133 feet. Length over all will be 68 feet and weight of hull, planes, motors, gasoline, equipment and armament will total 21,450 pounds, a matter of more than ten tons to be propelled through air. It will have a cruising radius of 750 miles on the 4,750 pounds, or 700 gallons of gasoline, for which space has been provided. This radius can be increased by supplying more gasoline capacity at expense of other equipment.

"When one looks back a very few years and sees the tremendous development in the aeroplane from the fragile thing of bamboo, piano wires and muslin to the heavily armored and armed war planes of today it is not hard to realize that its possibilities are only beginning to be comprehended."

### Balloon for National Guard of New York, Aeroplanes for Missouri and Colorado, Result of National Aeroplane Fund

A LARGE balloon for the National Guard of New York, for use by the Signal Corps or the Coast Artillery or both, and courses of instruction in aviation for four members of the Militia of New Jersey are among the latest contributions to the National Aeroplane Fund which was instituted by the Aero Club of America several months ago.

Mr. Robert Glendinning, a sportsman and a member of the Aero Club of America, recognizing the value of a balloon in the National Guard for the purposes of observation and spotting artillery fire, has presented his balloon "L'Ecureuil" to the Militia of New York State, in a letter to Mr. Alan R. Hawley, President of the Aero Club of America, and the generous offer has been transmitted to Brigadier General L. W. Stotesbury, the Adjutant General of New York.

The National Aeroplane Fund, appreciating the fact that there will be some expense connected with the operation of the balloon, has contributed \$100 toward the preliminary cost of operating it.

The balloon, which won first prize in the Pittsfield balloon race of 1914, with Mr. Glendinning as pilot, has a capacity of about 38,000 cubic feet, and will carry three men with ease. In the above race, the balloon, after having been inflated with ordinary illuminating gas instead of hydrogen gas, and carrying two men, rose rapidly and easily and was soon lost to view. It can be used as military captive balloon by mooring it at a given place, where it may ascend to a height of 2,000 feet. It is controlled by a line attached to the windlass of a gasoline motor, and may be equipped with telephonic connection with the officers in charge of the batteries, who transmit the reports of the observers to the men in charge of the guns.

Balloons have been used extensively at fortified places in the European war as "lookouts" when aeroplanes have not been available for the purpose, and for observing the effects of artillery fire. As we have but twenty aeroplanes in the Army, Navy and Militia of this country, it is not only desirable but necessary that we urge our first line of defense, the Militia, to become familiar with the possibilities of using balloons for the purposes outlined above. Mr. Glendinning's generous offer has made this possible for the New York Militia.

The offer to train four members of the New Jersey Militia comes from Mr. John E. Sloane, President of the Sloane Aeroplane Manufacturing Co., of New York and Garden City, and the men—two to be trained as pilots and two as mechanics—will be selected as soon as possible by the Adjutant General of New Jersey. It was considered advisable to have four men so that the development of aviation corps will not be hindered in case one or two members should retire from the Militia.

The Aero Club of America has also just been advised by Mr. A. B. Lambert, Chairman of the Advisory Board of the Missouri State Aeronautical Society, that a movement to raise \$20,000 for two aeroplanes and the training of four officers of the Missouri Naval Reserve and National Guard has been started, and that \$1,000 of this sum has already been raised in the city of St. Louis.

The Aero Club of America has also been advised that representative men of Colorado have started a movement to give aeroplanes to the Colorado National Guard, and are raising \$20,000 for the purpose. Preliminary to raising this sum, the Colorado Aero Club has been organized by Messrs. Charles Alfred Johnson, J. Foster Symes, Robert R. Hall, Claude K. Boettcher and Tyson S. Dines.

Recent cash subscriptions received by the National Aeroplane Fund are as follows:

Emerson McMillin, 11 per cent. bonus on all subscriptions received during month of October, \$2,500; Edwin B. Sheldon, \$250; Mr. and Mrs. John Markle, \$250; Gerald L. Hoyt, \$100; Mrs. S. N. Hinckley, \$100; Mrs. Gardner Sherman, \$100; Mrs. Sidney Webster, \$100; Mrs. Francis A. MacNutt, \$100; Heinrich Schniewind, Jr., \$100; Lloyd Phoenix, \$100; Robert L. Pierrepont, \$100; William A. Read, \$100; C. Oliver, \$100; Charles G. Curtis, \$100; W. E. Boeing, \$100; Frederic S. Gould, M. D., \$100; Archibald Rogers, \$50; Paul Moore, \$50; P. H. Jennings, \$50; F. B. Hoffman, \$50; Mrs. Amory R. Lawrence, \$50; Samuel A. Walsh, \$50; Mrs. William Walter A. Phelps, \$50; Jefferson Seligman, \$50; Mrs. Harriet I. Backus, \$50; Franklin H. Gregory, \$50; William J. Riker, \$50; George P. Block, \$50; Mr. F. D. Waterman, \$50; Mrs. H. S. Bowen, \$50; Mr. Lester Leland, \$50; Mr. and Mrs. Gardner Meeker, \$40; Mrs. O. A. Campbell, \$25; James A. Thomas, \$25; Mrs. Anson W. Burchard, \$25; Guernsey Curran, \$25; John L. Cox, \$25; Graham F. Blandy, \$25; George V. Vanderpoel, \$25; W. R. Peters, \$25; Wm. D. N. Perine, \$25; W. F. Newberry, \$25; John C. King, \$20; Miss Marion Scofield, \$20; Mrs. John W. McBurney, \$15.





# THE NEW

## Large Aviation Center Established at Newport Curtiss Company Selects Newport News

The Curtiss Aeroplane Company has selected Newport News, Va., as its winter headquarters for experimental work and training and has made arrangements with the Coast Aeronautical Station (a private company incorporated to carry on experimental work, and make Newport News an aeronautical centre) to use the latter's equipment.

The Curtiss Company will send to the new headquarters three J. N. land machines of 90 h.p.; one Model 3, of the type that Victor Carlstrom flew from Toronto to New York City a short time ago, and four Model F 90 h.p. boats.

The pilots of the land machines will be Victor Carlstrom and Bert Acosta, and of the water machines Walter Lees and Victor Vernon. Vernon Castle, the famous dancer, is now at Newport News receiving tuition, but he expects to finish his course in about three weeks.

Very many natural or established conditions operated in favor of the selection of Newport News for the location of this important branch of the Curtiss work. First, the weather conditions are decidedly favorable. Its location on Hampton Roads gives a great expanse of quiet waters for experimental work and student flying. The great shipyards there make it a rendezvous for many men skilled in the mechanical sciences, and the city is within easy reach of both Washington and New York, as well as within flying distance of Florida.

Eventually there will be facilities at the Newport News training school for 500 pupils, with not more than four or five students to each machine. If necessary the Curtiss Company will promptly send fifty machines to the winter station.

The land and the water schools will be operated together. All machines are to be equipped with either the Dep or the Curtiss controls, as the pupils may desire. It is the determination of the management to turn out efficient and capable operators in the shortest possible time. There are thirty pupils there now, most of whom are Canadians.

### Qualify for Licenses

George H. Witts, Alfred J. Croft, Warren A. Lord and August Thiele, all students of the Curtiss School at San Diego, California, all qualified for their pilot's licenses on December 18. Messrs. Witts and Croft are now in New York making arrangements for the opening of a flying boat school in the neighborhood of New York in the spring.

William Thaw, 2nd, the American aviator, who has done such excellent work for the French Aviation Corps, and who is now home on a short leave of absence, in his double-motored Caudron machine.



### Three Aviators Home from France

Home on an eight-day leave of absence, William Thaw, Elliot Cowdin and Norman Prince, the American aviators who have been decorated with the Military Cross for bravery in the French Army, arrived home on Dec. 23 on the liner Rotterdam and will return on the Rochambeau on Jan. 1.

Mr. Thaw, who has attained the rank of Lieutenant, stated that he had not given up his American citizenship, as that was not required by the French Government when a foreigner wished to join the Army in time of war. He and his two companions received special passports from the military authorities in Paris, which would be taken up on their return.

Mr. Cowdin said that the worst feature of flying high was the intense cold.

"About 12,000 feet is the average altitude," he continued. "The Germans can hit us, no matter how high we go, if they see us in time, and it rarely happens that one of our aviators makes a flight without having his machine hit. There are 1,200 aviators in the French Army and 800 training in reserve. The Aviation Corps, with all its accessories, is as large as the entire Army of the United States."

Mr. Cowdin declared that Congress should make a large appropriation immediately to develop the Aviation Corps of the United States Army.

George S. Viereck, editor of the *Fatherland*, of New York, has telegraphed to the State Department at Washington a request for the arrest of the three aviators, basing his request upon the international law and Article II. of the Peace Convention at The Hague in 1907, which says:



A neutral power which receives in its territory troops belonging to a belligerent nation shall intern them, as far as possible, at a distance from the theatre of war.

Mr. Prince's father, Frederick H. Prince, a Boston banker, declared that he would fight any move to intern his son. "Why should Germany demand that my boy and the other American aviators be interned here when there are many officers of the French Army here against whom such action has not been sought?" said the elder Prince, when informed of the proposed action.

#### Naval Consulting Board

Secretary Daniels' Naval Consulting Board of experts, of which Thomas Edison is chairman, held several meetings in New York last week and among the propositions considered by the board was the standardization of aeroplane parts, according to the scheme outlined in a recent issue of AERIAL AGE.

Howard E. Coffin, chairman on the Committee on Production, Organization, Manufacturers and Standardization, immediately after the executive session, said:

"We have recommended to the Navy Department the placing of the facilities of the automobile industry of the United States behind the aviation department.

"We have recommended the training of aviators to the use and construction of gas engines. We propose to have them

and to the various automobile plants at least three months, to work under an officer. This training is absolutely essential.

The Board of Directors of the National Automobile Chamber of Commerce, through its chairman, Al Reeves, this morning notified us that they will place their entire facilities at the disposal of the Army and Navy immediately.

In case of necessity we will be able to put 1,000 men into the aviation service in ninety days.

Efforts have also been taken to place the aviation industry on a basis of standardization. It is in its infancy yet, and the attempts have so far been made.

Experience in Europe has shown that only 30 per cent of the aeroplanes in operation are available at one time. That if the United States had one thousand aeroplanes it would be a sweet job if the propeller of one machine, or its landing gear, did not fit another."

W. A. Speery, who succeeded Henry A. Wise Wood as chief of the Bureau of Aeronautics, said:

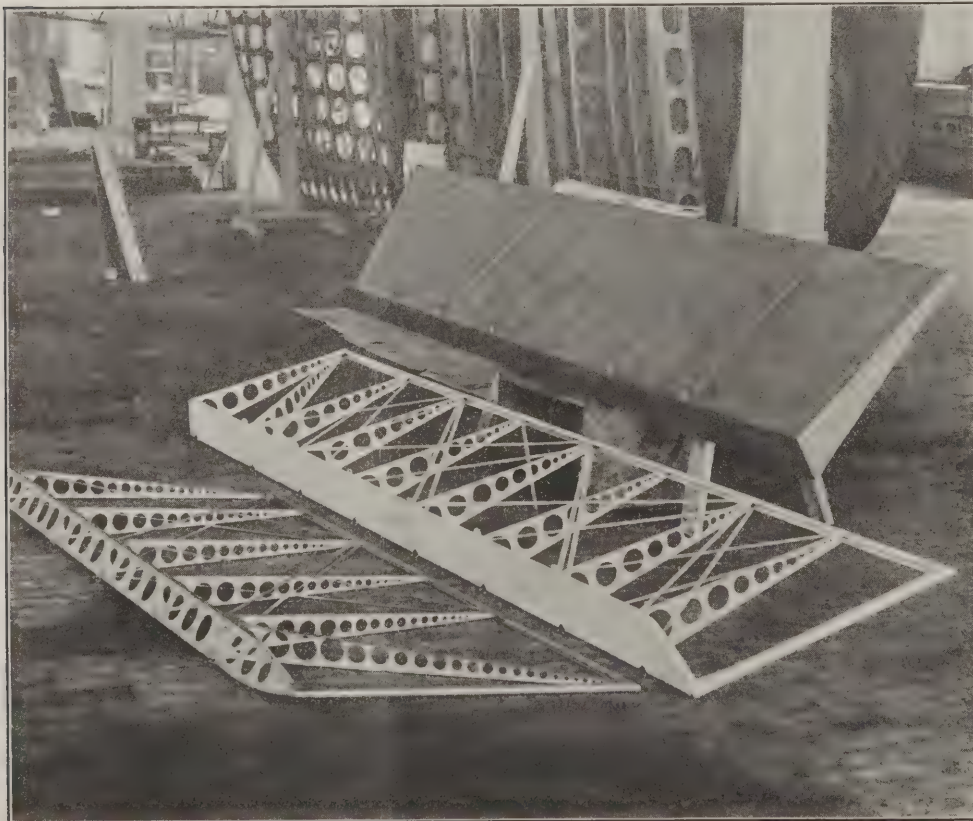
"We have developed a scheme whereby an aviator will be able to overcome drift while navigating over water without landmarks. He told how aviators at Pensacola had found themselves to be seventy miles inland when they thought they were navigating over water."

The Packard Automobile Company, of Detroit, announces its intention to assist the government in every way in its plan for adequate preparedness, and it offers its factory as a training place where the government may teach aviators how aeroplane motors are made. In the early spring the company will open an experimental aviation field on Lake St. Clair, near Mt. Clemens, Mich.

"We have been working on aeroplane motors for six months," said Mr. Vincent, Vice-President of the Packard Company, speaking at the company's office in Detroit, "and expect to try it out in the spring. We have ordered one aeroplane from a New Jersey company and will order more later. When our experiments are completed we will go into the manufacture of aeroplane motors on a commercial basis. The manufacture of aeroplanes has been highly developed, while the motor itself has been neglected.

"We are interested in this matter, both as a commercial proposition and as a matter of preparedness. A recent article in a technical magazine brought out the fact that France was balked in its early aviation efforts in the war because the manufacture of motors had been left to aeroplane men. Germany, on the other hand, had put the making of their air motors in the hands of automobile factories.

"We are glad to co-operate with the government in the matter of giving aviators better training in motor craft."



A detail view of the all-steel construction of the tail flaps of the Sturtevant aeroplane.



### Mr. H. K. Chow Returns to China

Employees of the Engineering Department of The Curtiss Aeroplane Co., Buffalo, N. Y., tendered a banquet Tuesday night, December 14th, to Mr. H. K. Chow, of that department, on the eve of his departure for his home in China. Half a hundred of his friends turned out for the occasion. Dr. A. F. Zahm, who is in charge of the Research Department of The Curtiss Aeroplane Co., expressed the sentiments of the company in bidding the guest of honor good luck in his prospective aeronautical work soon to commence in China. Part of this work, as described in Mr. Chow's address, will consist of a nation-wide campaign to stir up enthusiasm for aviation and he hopes to establish an Aero Club of China and eventually, perhaps, a Chinese Society of Aeronautical Engineers.

Mr. Chow is a member of the first graduating class in aeronautical engineering in the Massachusetts Institute of Technology and is the author of several valuable papers on aeronautics. He has been for some time in charge of the aerodynamical and mathematical division of the Research Department of The Curtiss Aeroplane Co.

At this banquet was manifested the lively company spirit that exists among the Curtiss employees. A series of other meetings is planned for the winter.

### Military Aviation News

Acceptance tests of the two Martin training type aeroplanes, fitted with Renault motors, have been under way at the Signal Corps Aviation School the past week. One of the four Martin Model S hydroaeroplanes is also under test. These hydros are intended for Philippine service. They have a wing spread of fifty-three feet and are driven by six-cylinder Hall-Scott motors of 125 h.p.

Lieutenant Commander Van Steyn, of the aviation branch of the Holland Navy, has been an interested witness of the foregoing tests. He is in the market for several of the large hydros for his government.

Four officers of the Portuguese Army, Captain Duarte, Lieutenant Aragao and Sub-Lieutenant Valente of the cavalry and Sub-Lieutenant Beja of the infantry, have reported at the Signal Corps Aviation School and are under instruction in flying.

During the week ending December 18, 1915, 98 flights were made at the Signal Corps Aviation School, of a total duration of 37 hours 26 minutes.

### In Memoriam

William S. Luckey died on December 20 at the Royal Victoria Hospital, Montreal, of injuries received at Sturgeon Falls, Ontario, Sept. 6, when his back was broken by a fall from his machine. His wife, mother, and two sisters survive him.



Mr. Alfred J. Croft who has just completed a course in aviation at San Diego, Cal.

William S. Luckey was best known to New Yorkers as the winner of The New York Times Aerial Derby on Oct. 13, 1913. The race was around Manhattan Island, and Luckey covered the course of about sixty miles in 52 minutes and 53 seconds. He drove a 100-horsepower Curtiss machine, and as he had to combat a wind of more than forty miles an hour, his was considered a splendid performance. It was the more remarkable because he was laid up and crippled with rheumatism.

Mr. Luckey was one of the surprises of aviation. He was nearly 50 years old, with iron-gray hair, and looked more like a prosperous business man than a flier. Until the beginning of 1912 he had been a manufacturer of trunks and suit-cases. Then he deliberately took up flying for the sake of his health. His early days as an aviator were unfortunate, as he had a number of minor accidents, usually resulting in the breaking of his machine. However, as his skill increased, he became one of the best and steadiest of the exhibition fliers.

His fatal accident took place on Labor Day, while he was flying at the Sturgeon Falls Fair, in Canada. At the Aero Club of America recently it was said that he had made a most successful flight, and was about to land when the tail of his machine struck a railroad embankment, throwing him from his seat to the ground. In making the landing, he tried to fly over a railroad embankment and under the telegraph wires. His machine would have passed between the two safely if he had not turned it upward, throwing the tail down, so that it struck the embankment. He was unconscious when picked up and was immediately rushed to the Victoria Hospital, in Montreal, where it was found that his back was broken.

The "small metal parts" room at the Buffalo plant of the Curtiss Motor Co.







A group of employees at one of the Curtiss Motor Company's factories in Buffalo—a striking testimonial to the tremendous development which has already taken place in the aeronautical industry—and it's only in its infancy!



# NEW SIX-CYLINDER DIRECT AEROMARINE MOTOR

**T**HE Aeromarine Plane & Motor Co. has just brought out a new dome-head six-cylinder vertical direct motor possessing very interesting features.

In place of the flat head type, the heads of the cylinder are copper-jacketed, which jackets are put on in the Aeromarine plant. The copper water pump is deposited from the base of the dome to within three inches of the base of the cylinder.

A special feature of the model is the housing on the motor propeller end which is detachable and can be made quickly into the geared type by simply detaching the housing to retain the reduction gears.

Double Bosch ignition is employed and Zenith carburetors are installed. The cable from the magneto to the spark plugs is incased in metal tubing rigidly set on the side of the cylinder and intake manifold. The spiral gearing which drives the magneto is of generous proportions and runs continuously in a bath of oil. Attachments are made for speedometer, pressure gauge, etc.

The lubrication of the motor is obtained through the medium of a hollow crankshaft, oil being forced through the hollow crank at a pressure of 12 to 15 pounds.

The entire shaft is machined from the solid round forged billet of specially selected steel, heat treated and ground true. The crankshaft is assembled to the upper portion of crankcase, this permits the lower portions of the case to be removed readily, whilst the remainder of motor is undisturbed in the aeroplane.

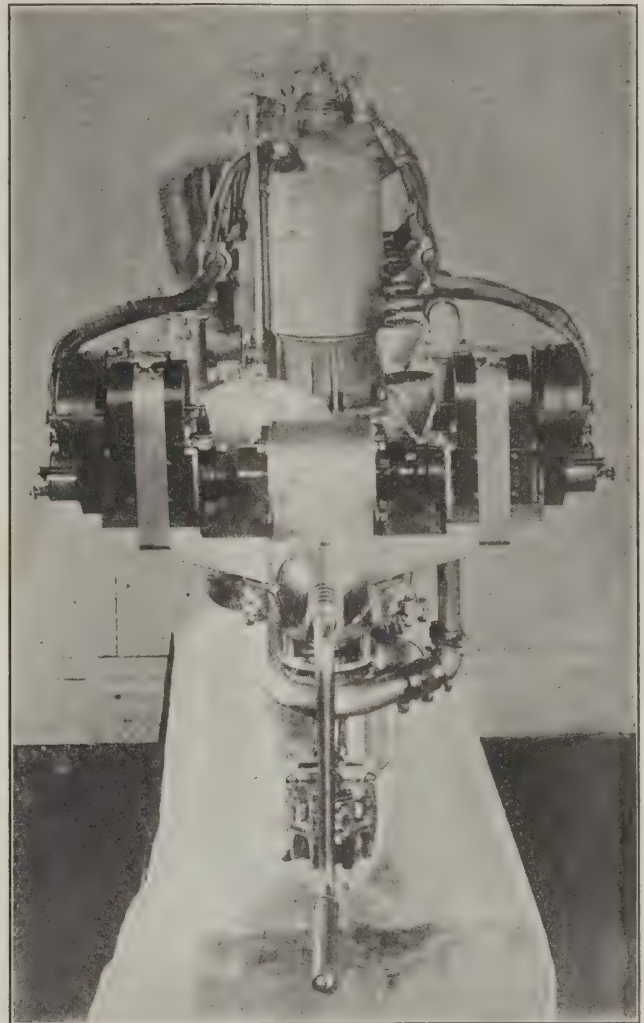
There is also an external oil strainer by which the motor can be cleaned by simply removing the retaining bolt with the loss of only about a gill of oil.

The Aeromarine oiling system has been designed to meet the requirements demanded in the present day aeronautical motors, viz: That lubrication shall be maintained and unchanged, irrespective of the angle of ascent or descent, loop the loop, or upside down flying.

These motors are provided with oil reservoir of five gallons capacity. When the motor is running, the gear driven duplex high—and low—pressure oil pump takes oil from the reservoir and delivers it through ways machined in solid walls of crankcase, etc., to the crankshaft bearings, through these bearings and into the hollow crankshaft; thence to the driving gears mounted on crankshaft, connecting rod bearings, etc.

By means of one of these drilled oil ways, oil is delivered to and through the hollow camshaft, the camshaft is cross drilled in line with its bearings, by this means supplying them with constant oil feed, also oil is carried to the cam follower guides, etc.

All the surplus oil is thrown by the rapidly revolving parts to the sides and the bottom of the under-half of crankcase, whereupon it drains down and through an integral hollow



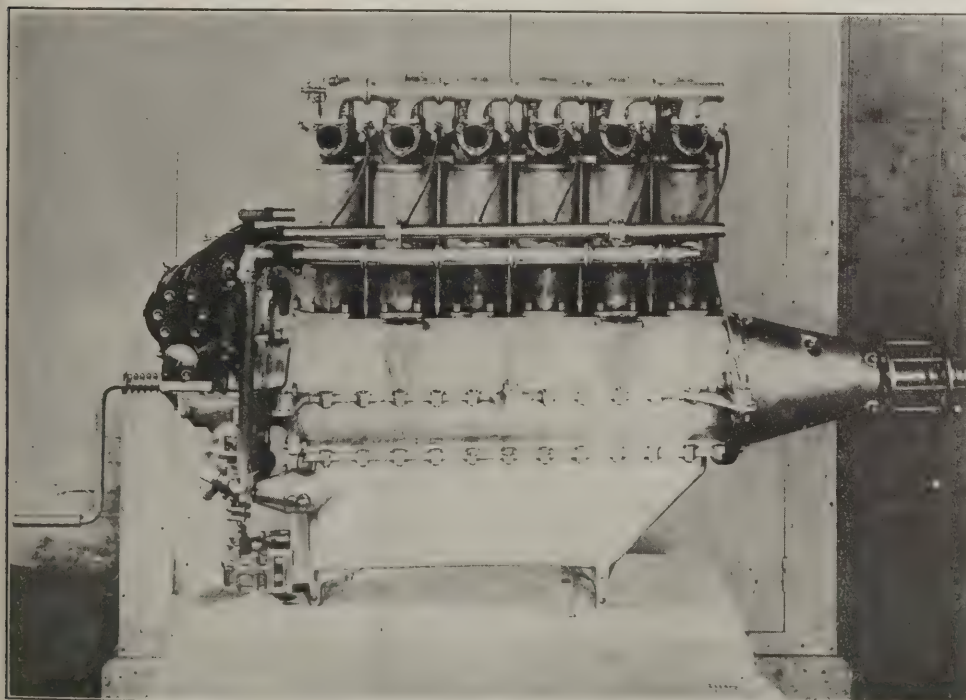
extension of the under-half of crankcase. This extension leads down and through the oil in reservoir to the low pressure gear train of the duplex oil pump, from which it is returned to the reservoir and cooled.

By means of this system, the crankcase is constantly and thoroughly scavenged of all surplus oil and the danger of flooding the cylinders at any position of the motor is entirely eliminated.

Large screens are fitted to both the intake and exhaust ports of the duplex oil pump, also a screen is provided in the oil filling elbow. A special oil pressure regulator is built integral with the oil reservoir, by simply removing one nut the bell-shaped cover may be removed and the oil pressure adjusted to suit the installation of the motor, location of the pressure gauge and running speed, etc.

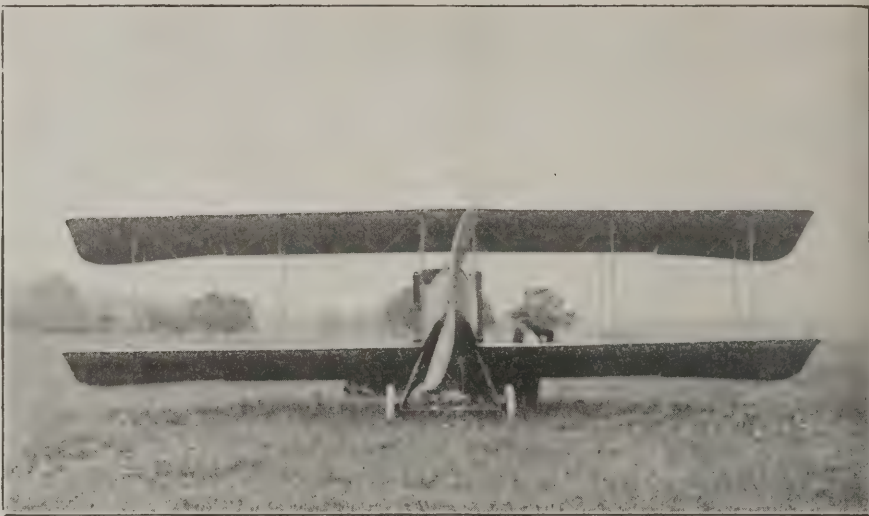
The main bearing caps are each provided on their under-side with a drop-forged steel bridge piece, drilled to receive the retaining bolts, these retaining bolts are arranged in transverse line to the crankshaft, pass entirely through the crankcase in a vertical direction, and enter nuts on the top of cylinder flange. By an ingenious method these bolts are securely anchored in the crankcase, thus enabling the nuts to be tightened or removed without disturbing the

(Continued on page 381)





## SLOANE TRACTOR BIPLANE TYPE "H-1"



**T**HE Sloane Type "H-1" biplane has been designed to meet the requirements arising from the present war. In every way it is a great advance over the various types of monoplane and biplane formerly built by the Sloane Manufacturing Co. This machine combines the best features of the previous Sloane machines and the improvements found necessary from experience in the present war.

The flying qualities of these machines are very satisfactory. They are stable and easy to control even in heavy weather.

We have exceeded the usual requirements for strength in the various parts, so that the whole machine has a higher factor of safety than the usual machine built in this country.

This machine is designed to carry a load consisting of pilot, passenger, four and one-half hours' fuel and an additional weight in the neighborhood of 300 pounds.

The seats are arranged in tandem; the pilot seat being just behind the trailing edge.

The principal features of the design are the wing curve, which has a very good lift drift ratio; a back sweep of 10 degrees, a stagger of 10 degrees, and a slight dihedral angle.

### Motor

A 6-cylinder motor of 125 to 130 h.p. is the standard equipment in this machine. This is a vertical water-cooled motor, with a 5-inch bore and 7-inch stroke. Both valves are located in the head and are operated by an overhead camshaft. A force feed oiling system is incorporated in the design; ignition

is by two of the new type "Dixie" Splitdorf magnetos. The carburetor is of the Zenith two-jet type.

### Planes

The planes are standard construction. The ribs are built up and then slipped over the beams and the whole wing assembled and fastened. The beams are of selected Alaskan spruce; the front beam is 2 x 3 and the rear beam 2 x 2½; the ribs are of basswood, securely mortised and fastened. The internal bracing is cable in the bay next to the fuselage, and plated steel wire in the outer bays.

Three steel compression members are located between the beams at strut points. Beams are reinforced at these points so that wing clip bolts do not pass through beams. All trailing edges are metal tube.

### Covering

All surfaces are covered with unbleached linen of 100 lbs. tensile strength, and treated with four coats of special dope and spar varnish.

### Struts

These are of spruce streamlined and more than amply strong enough to provide a factor of safety of six. Interplane bracing is by cables double in lateral field and single in fore and aft field.



To the immediate left of the fuselage (from right to left) Lieut. W. C. Childs, Mr. Charles H. Day, Mr. John E. Sloane, together with some of the mechanics of the Sloane Mfg. Co.



### Fuselage

The fuselage is rectangular in section—tapering to a vertical pointed section—at the rear.

The longitudinals are of ash forward of the pilot's seat, and of spruce back of this point. They taper from 1½ inch square to 1 inch square at the rear.

The fuselage is braced by properly spaced uprights, which are held in place by specially designed clamps located without piercing the longitudinals. The whole frame is cross wired and braced; back of the pilot's seats solid wire is used; forward cable. Where necessary additional compression and tension members are provided.

The lower surfaces are attached directly to the fuselage and the upper planes are supported by short struts from the top of the fuselage.

The streamline of the fuselage is obtained by enclosing the whole nose in a streamline cowl of aluminum; and cowls over the cockpits, so that only the head of the passengers are exposed. The rest of the fuselage is covered with cloth treated in the same way as the wing surfaces.

### Control Surfaces

These consist of vertical rudder and empennage stabilizer

and two horizontal rudders. Trailing edges and posts of these parts are set in steel sockets and the whole thoroughly braced.

### Motoring Mounting

The engine is mounted on two ash beams 2" x 5", which are hung on two hot drawn steel plates that reinforce the fuselage as well.

### Radiators

These are vertical tube, specially designed for this machine. They are mounted one on each side of the fuselage.

### Landing Gears

This of the two-wheel type. The tubular streamline axle is mounted on two extra heavy laminated U's. Two steel tension and compression members maintaining the spacing of these two U's. Four cables stiffen the landing gear so that side swipes will not affect it. The usual rubber cord shock absorbers are used in the axle. The axle may be removed without disturbing the rubbers. The tires are 26" x 4" double tube.

The Sloane tractor just getting away from the ground.



### Goodyear Co-operates with Employees

In a Christmas statement to employees, The Goodyear Tire & Rubber Company announces the establishment of a plan of retirement awards, and also a group insurance plan for Goodyear workers, male and female.

The company already has in operation a plan whereby Goodyear men, in office, sales division and factory, who show conspicuous ability, are made "young partners" by acquiring common stock under easy conditions.

A home-building plan for Goodyear employees has also worked out with remarkable success.

The retirement awards make provision for stated monthly payments for life to men who have reached the age of 70 and women who have reached 65, and there is also a condition under which old employees may retire, with awards, under the age limits mentioned.

Under the insurance plan all employees of the company—in factory, in office and the company's many branches, are eligible.

In brief, Goodyear will give any employee upon its payroll an insurance policy for \$1,000, free of all cost to the employee, provided the employee is or becomes a member of the Goodyear Relief Association, which provides sick and disability insurance and is already a Goodyear institution of long standing.

The "officers and directors," says the statement, "appreciating the spirit of foresight manifested by certain men associated with the organization, and believing that life insurance is one of the best means of providing for the future, herewith present a life insurance plan.

"The directors also feel that persons who have spent continuously all or many of the most useful years of their lives in giving their energy and efforts to the common good of the

organization are worthy of consideration from the company after their useful years are past and their ability to earn sufficient money is gone." Then follows the proposition in detail.

(Continued from page 379)

bolt from its permanent position.

When this construction is considered in connection with the tie-down rods extending upward to light bridge pieces, resting on and across the top of cylinder heads it will be readily seen that this is an ideal method of staying the internal stresses, initial pressures of explosion and reaction forces, etc.

At the other extremity of crankshaft further additional ball bearings are employed to carry the load of driving the cam shaft, water and duplex oil pumps and magnetos.

All bearings throughout the motor other than ball are die cast Fahrig metal and interchangeable.

These motors have been subjected to exhaustive tests in order to prove their mechanical construction, ignition and carburetor efficiency with the result that we have made as standard equipment two Bosch magnetos, representing duplex synchronized ignition, each cylinder being provided with two spark plugs. Two three-way intake manifolds and two Zenith carburetors with synchronized throttles have proven an efficiency impossible to obtain with any form of six-cylinder manifolds and single carburetors.

These motors can be provided with positive means for driving the generator required for lighting, starting and stabilizing; also for driving gasoline pump and revolution indicators. It has been expressly kept in view that they should in every detail conform to the requirements of the United States Government specifications.





# FOREIGN NEWS



## ALBANIA

Two aeroplanes, one of which was a German, dropped four bombs on Scutari, Albania, on December 23, killing five civilians and injuring sixteen women and children.

## AUSTRIA

An Austrian seaplane squadron bombed the railway station, the electric works and points of military importance at Ancona, on the Adriatic coast of Italy, and returned unharmed despite a heavy fire.

## BELGIUM

The King and the Queen of Belgium had a narrow escape from death when German aviators threw bombs on the fishing village where they have established a home. The King and Queen were coming out of church from mass with the rest of the congregation when six German aeroplanes appeared, flying low. Apparently they were coming from Ostend.

The King at once told the people to scatter and take shelter, but the aeroplanes approached so rapidly few had time to comply with his instructions before the machines were over the village. Two bombs fell a few yards from the King and Queen, but they were not hit by the flying fragments.

A correspondent says that "this is the fifth air raid which has been absolutely unjustified, since the village is unfortified and is inhabited only by fishermen. What makes it worse is that the aeroplanes came from the section of the German front commanded by the Prince of Wurttemberg, first cousin of the Belgium King."

## FRANCE

A torpedo boat established a new record for gunnery not long ago by hitting a German hydroaeroplane in flight and bringing it down with one shot. Two German hydroaeroplanes from the air station at Zeebrugge, flying over the sea close to the water, were perceived and fired upon the torpedo boat at a point ten miles to the north of Nieuport, when the machine fell into the sea. The two officers on board were made prisoners.

A squadron of seven French aeroplanes made a night raid on Sablons, railway station, south of Metz, but within the entrenched camp, on December 18. The official communication says that the squadron dropped fifty-one shells of 90 (millimeters) caliber and two shells of 155 (millimeters) caliber. One of our machines, on account of motor trouble, was obliged to make a landing, which was accomplished without incident within our line near Dieulouard, to the south of Point-a-Mousson.

"Enemy aeroplanes this morning flew over the district of Poperinghe (southwest of Ypres) and dropped about a dozen bombs. One woman was killed and one woman and two children were wounded.

"The German official statement of this raid is to the effect that only property was damaged."

## GREAT BRITAIN

It is no longer a secret in London that the Allies are planning an aerial raid on Germany that will supersede in importance everything heretofore attempted in aerial warfare. Five hundred aeroplanes of nineteen different types will be launched against the strongholds of Germany with bombs enough to insure the destruction of any objective point if only a fair percentage of the missiles hit the mark. Heretofore the air raids have been desultory and on a small scale. The offensive that is now being prepared with all the speed that the resources of the government can command will be comprehensive and concentrated and by it the government hopes to deal a blow to the enemy that will count tremendously in bringing the war to a close. Where the air fleet will strike is not known, but there is a probability that it will be directed against the Krupp works or the Kiel Canal, in which the German fleet is in hiding, or possibly against both points.

A British authority says that heretofore the aerial raids have been in the nature of reconnaissances preliminary to the launching of an actual fleet of the air which will carry sure destruction to any point which it may be directed to attack. As at present planned the air fleet will consist principally of giant aeroplanes, each carrying about 3,500 pounds of explosives. The aeroplanes are to be divided into squadrons of twenty each. The battle cruisers carrying bombs and rapid fire guns will be preceded by two scout aeroplanes, which will by means of wireless apparatus keep the cruisers informed of the conditions they find. On reaching the place to be attacked the scouts will rise to a height beyond the range of the anti-aircraft guns.

The ships of each squadron will fly in a line which will be about a mile and a half from the first to the last cruiser in the squadron. On arriving at the city to be attacked the bombs will be dropped at intervals of 45 seconds as the aeroplanes fly over it, and in ten minutes a squadron will have dropped many tons of nitro-cellulose, or some other explosive of great powers into the stronghold. Each succeeding squadron (there will be about twenty-five in all) will do the same so that if the aviators have any degree of success in launching their bombs nothing can withstand this projected four hours' hail of shells weighing 250 pounds each, for by the time the entire fleet has passed about 7,000 terribly destructive bombs will have been dropped into the territory of the enemy. Ordnance experts declare that there is nothing known in human construction that can survive such a downpour of explosives.

The giant aeroplanes being built in America will be used in this offensive, and in anticipation of the need for many additional aviators to man the fleet every effort is being made to train the required men in the various government schools.

Work on the fleet is progressing at top speed. The equipment of the British now includes no less than nineteen types of aeroplanes of all sizes. But the great aerial offensive is not to be confined to English forces. France will share in it. If the plans for this offensive can be carried to fruition the effect of this fleet on the length of the war may be easily conjectured, even as the result of one successful raid on an important point. England does not expect that this squadron will return intact, but its experts think that the loss will not exceed five or ten per cent, which they regard as moderate for an operation on so extensive a scale.

## GERMANY

Count Zeppelin, builder of the dirigible, has been elected a member of the First Chamber of Wurttemberg.

## TURKEY

There has been printed in Copenhagen the statement of a Dane in Constantinople who declares that the Krupp Armament Works outside of Constantinople have been destroyed by bombs dropped by British airmen.

## RUSSIA

An official communication issued by the War Office last week says: "Our aviators successfully bombarded the rear approaches to the enemy's positions in the Godutzchki-Komag region east of Svientziany, causing a panic among the convoys."

## SPAIN

King Alfonso of Spain is learning aeronautics under the instruction of A. J. Engel, an American, who recently returned to New York. "The King knows all about it theoretically," said Mr. Engel, "but his people won't allow him to make any ascensions. There's no use spoiling a perfectly good King by letting him drop from the clouds," is a way they have of expressing their objection. King Alfonso is a fine fellow. He is absolutely democratic. He would make a big hit here."

Mr. Engel expects to take back to Spain \$1,000,000 worth of aeroplanes at \$15,000 apiece.



W. Leonard Bonney who is flying for the Carranza forces in Mexico.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

### THE AERO SCIENCE CLUB OF AMERICA

29 West 39th Street New York City  
PACIFIC NORTHWEST MODEL AERO CLUB  
915 Ravenna Boulevard, Seattle, Wash.  
LONG ISLAND MODEL AERO CLUB  
401 Grant Avenue, Cypress Hills, L. I.  
BAY RIDGE MODEL CLUB  
8730 Ridge Boulevard, Bay Ridge, Brooklyn

### DETROIT AERO RESEARCH AND MODEL CLUB

c/o William P. Dean, 1717 Concord St., Detroit, Mich.  
BUFFALO MODEL AERO CLUB  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
THE ILLINOIS MODEL AERO CLUB  
Room 130, Auditorium Hotel, Chicago, Ill.  
TEXAS MODEL AERO CLUB  
517 Navarro Street, San Antonio, Texas

### SPRINGFIELD MODEL AERO CLUB

Springfield, Mass.  
MILWAUKEE MODEL AERO CLUB  
455 Murray Ave., Milwaukee, Wis.  
CONCORD MODEL AERO CLUB  
c/o Edward P. Warner, Concord, Mass.  
PLATTSBURG MODEL AERO CLUB  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.  
MODEL AERO CLUB OF OXFORD  
Oxford, Pa.

## How to Construct and Fly Model Aeroplanes

By G. A. CAVANAGH

### Wings

A very important step in the construction of a model aeroplane is the making of the wings. The preceding article pointed out the necessity of the curve in the blade of the propeller to obtain the best results; the curve in the wings is likewise necessary, as the lift of a wing depends entirely upon the nature of the curve. Wings must also be made "streamline" to be most efficient, and in such cases care must be taken to strengthen the wings in such manner that but little resistance is offered. A very efficient set of wings may be made in accordance with the following directions:

For the main wing obtain three strips of spruce wood each 30 inches in length, two of them being  $3/16 \times 1/4$  and the third  $3/16 \times 1/16$ ; flat. Now to make them streamline, round off all edges and see that all sticks are smooth. Next obtain long strip of bamboo, at least  $1/2$  inch wide, and  $1/16$  inch thick. Next cut the strip into pieces, each piece to be 5 inches long. By holding these pieces one at a time so that 2 inches of the piece is in steam, they may be bent so that a curve  $1/2$  inch in depth is obtained. When this has been done take three pieces and cut each into four strips, making 12 altogether for ribs. Of course, by first bending the pieces of bamboo and then cutting into strips the ribs will curve all alike. The ribs are now ready for fastening to the sticks and each must be an equal distance apart. In order that the ribs may be evenly spaced it will be necessary to put a mark every three inches on the "entering edge" or heavy stick, and also on the "trailing edge" or flat stick. The other stick or main beam does not need to be marked, as this is fastened to the ribs after the ribs have been fastened to the two edges. By holding the ribs so that the curved ends rest upon the entering edge, the builder may fasten them thereon by thread and glue. The rear end of the ribs may be fastened to the trailing edge in the same manner. Of course, the rear ends must also be fastened where the marks indicate. The third stick, or main beam, may now be fastened from side to side of the frame under each rib at the highest point. When this has been done all sticks will have been fastened on the under side of each rib. This will complete the frame of the main wing or "plane."

The frame of the forward wing or "elevator" is made in the same manner as the main plane, but is only 12 inches in span or "spread" and 4 inches in width or "chord" and is made without the use of the center spar or "main beam." This plane has but five ribs, each being placed 3 inches apart.

In covering wings many different kinds of material may be used, but the most durable covering is that of China silk. To cover the frame of the wing cut out a piece of silk so that it measures about 2 inches longer and 2 inches wider than the frame. The silk may then be held fast to the frame prior to sewing, by the use of pins; the extra inch of silk being brought around to the under side of the frame. In pinning on the silk be sure and draw it taut each time before inserting a pin. Next sew the silk close to the edges of

the frame and when finished remove the pins and cut off surplus amount of silk that hangs from the under side of the frame. Now coat the wings with shellac or varnish, and when done lay aside to dry. Both wings, of course, should be covered and coated alike and when the coating has dried the silk should be as taut as a drum.

In the next article, which will appear in the issue of January 10, the frame of the model will be described.

### Aero Science Club of America

In view of the fact that December 25th and January 1st come on holidays, the two meetings scheduled for these dates will be consolidated and held on December 30th.

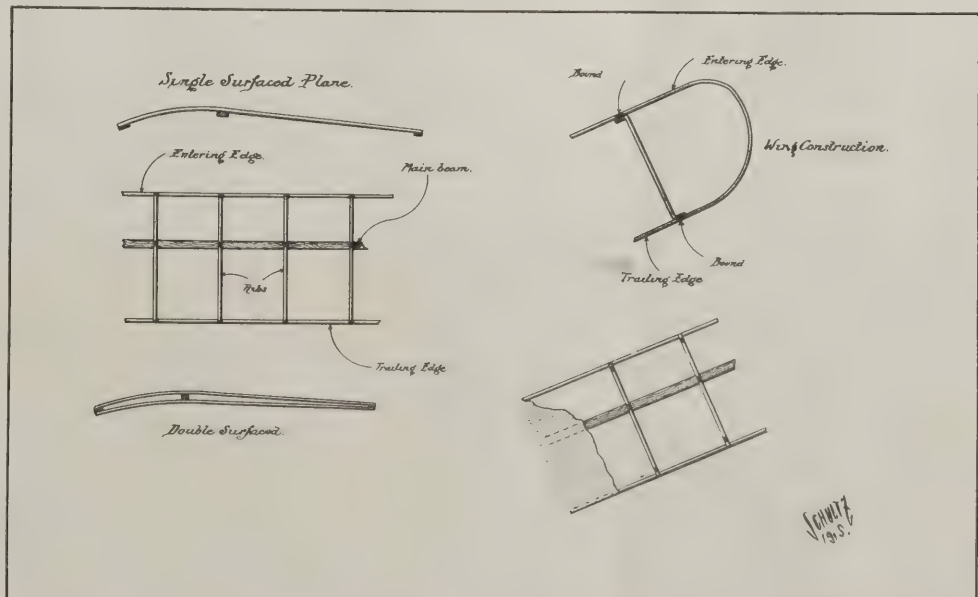
Mr. Durant reported at the last meeting that he was negotiating for the use of an armory and expected that by the first of the year the permission will be granted. Messrs. McMahon and Schober are now preparing compressed air models, which they will fly indoors during the winter. Other events will be scheduled. Mr. Cavanagh will represent the club at the meeting of the Elmwood School Model Aero Club, Orange, N. J., Thursday, December 23rd. For further particulars address the Secretary, 29 West 39th street, New York City.

### Illinois Model Aero Club

By ARTHUR E. NEALY

A review of the outstanding events of 1915 will not be inappropriate, coming, as they do, at the end of what may well be termed the greatest and most successful year of American model aeronautics.

Commencing in the early spring, a series of distance meets were held at Cicero flying field. Bad weather predominated throughout with poor results in competition. The series was won by Mr. Ellis Cook. Next came the announcement of the national model competition for the Villard Cup and members immediately commenced work anew on distance models. The I. M. A. C. finals in this type of machine were won by Mr. Nealy and Mr. Willis Hitt, President of the Club, with Mr. Cook second. The highly successful inter-city meet with Milwaukee followed, the Chicago club winning by a most uncomfortable margin. Next came the hydro competition, in which the I. M. A. C. carried off all honors, Mr. Hittle, Mr. Cook and Mr. Pease making an unbeatable trio. In July Mr. Donovan Lathrop made one of the most successful flights the model world has ever known, a flight of over four minutes by a tractor model. Lastly came the R. O. G. Villard competition in which Mr. Pease and Mr. Cook of this club took first and second places respectively.







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### It Often Happens

Henry Ford is going to make balloons for \$850 each. Better buy your stock now. They may go up.

German aeroplane pilot has dropped another bomb on Switzerland. That's great marksmanship.

#### The Plight of Aviator

Dolly—"Writing to Charlie?"

Nellie—"Yes."

Dolly—"I thought he was engaged?"

Nellie—"He writes to me that his best girl has thrown him overboard, so I'm dropping him a line."

There is six feet of snow in the Caucasus, where the Grand Duke Nicholas went, but Nick is six-foot seven. No need for an aeroplane.

#### Proved.

"What makes you feel sure that Timkins is an optimist?"

"My dear fellow, any man with a salary of \$12 a week who reads aeroplane advertisements is bound to be an optimist."



POT-LUCK

Courtesy Life

There is always room at the top for aeroplanes—and room at the bottom for submarines.

The only people who need to be "well off" are air pilots.

#### Wise

May—Bob drives his aeroplane very carefully since Belle accepted him.

Grace—Yes; Bob knows if he loses his pilot's license, he'll lose his Belle, too.

#### Telling a Secret

Can you keep a secret, Uncle?

Yes.

Well, auntie has eloped with the pilot and they've borrowed your 'plane.

#### A Definition

Debate: An argument or word battle of a formal nature, engaged in by two or more constructors, in which each tries to convince the other that he has the wrong idea, but only succeeds in convincing himself more firmly that he has the right idea.

Private Hawkins—Why is it that the Germans have begun to call their Zeppelins "Jokes?"

Private Lefevre: Ah, zat is so the English won't be able to see them, I suppose.

"I understand you have an aeroplane now," said the friend. Do you drive it yourself?"

"No," responded the aviator sadly, "nobody drives it. We coax it."

"Is there any way of stopping these cyclones?" asked the Eastern aviator.

"Oh, no," replied the Westerner; the best way is to get right along with 'em."

Mrs. Irving—I thought the manufacturer guaranteed your aero free of repairs for one year?

Mrs. Place—But that doesn't cover the repairs to what we run into.

#### Why Hens Are Good Airship Spies

A student of natural history publishes in a German scientific paper an odd article on the use of animals to signify the approach of enemy aeroplanes.

The writer, who is evidently quite serious, has noticed that the sight of certain animals is much keener than that of human beings, and comes to the conclusion that birds have the most alert vision, and that hens and pigeons are the birds most get-at-able, most easily trained and most reliable.

Hens protect their chickens against soaring birds of prey which the sharpest human sight cannot discover, and pigeons will fly in any weather and are extraordinarily docile.

The training of a hen or a pigeon to announce the approach of an aeroplane is much easier than one would think.

According to this German writer the best method of training the fowls to be aeroplane spies is to place them in pens in the vicinity of a descending air machine. As soon as the airman lands he is to rush at the unfortunate fowls and belabor them with a rod.

This practice is to be repeated until the hen or the pigeon believes its life to be endangered by anything on a large scale descending from the skies. After a week or two of this the terrified birds will strain their vision skyward all day long, and the remotest speck in the vault of heaven will flutter the dovescotes and hencoops as nothing else would.





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## \$10,000 Pan-American Aviation Trophy—Western Hemisphere Should Have 10,000 Aeroplanes

**E**NDORSING the plan of Alberto Santos-Dumont, who has pointed out to the Second Pan-American Scientific Congress, the fact that thousands of aeroplanes could be used today on this continent to solve difficult problems of transportation, and would form a valuable reserve which could be used in case of need to defend the nations of the Western Hemisphere, the Aero Club of America has offered a \$10,000 Pan-American Aviation Trophy, to be competed for between the representatives of the countries of the Western Hemisphere.

The trophy has been offered through the Brazilian Ambassador, who personally announced it to the representatives of the other countries of the Western Hemisphere, assembled at the Second Pan-American Scientific Congress.

The letter from Mr. Alan R. Hawley, president of the Aero Club of America, to Ambassador da Gama, announcing the offer of the Pan-American Aviation Trophy, follows:

Exmo. Sr. Domicio da Gama,  
Ambassador from Brazil,  
Washington, D. C.

MY DEAR SIR:

It is a source of extreme regret to me that I cannot be present with you to-day to hear the admirable address of your illustrious inventor and sportsman, Mr. Alberto Santos-Dumont, which I have just read.

I heartily approve the sentiment expressed by Mr. Santos-Dumont, and in the name of the Aero Club of America and the twenty-seven affiliated aero clubs approve the plan proposed.

We believe with Mr. Santos-Dumont that these aeroplanes of to-day which already make it possible to carry a dozen passengers and a ton of useful load at a speed of eighty-five miles per hour can solve most difficult problems of transportation, and that if applied for this purpose as well as for sport in and between the nations of the Western Hemisphere they will become one of the most effective factors in bringing these nations into closer and most friendly alliance. In the words of Mr. Santos-Dumont, "The aeroplane will knit the States of the Western Hemisphere into an integrally united, co-operating and friendly combination, allied for their well-being in sport, trade and commerce, as well as for strength in times of possible war."

There are thousands of places not connected by railways or roads right in the United States, and there must be tens of thousands on the Western Hemisphere—where aeroplanes

could transport mail and "express" merchandise at a fraction of the time required at the present time. Taking only two instances from a plan outlined by the United States postoffice, the aeroplane makes it possible to carry mail between Albany, New York, and Lake Placid, New York, in a district most closely connected by railway in two hours and fifteen minutes, whereas it now takes eight hours and ten minutes; between Santa Maria and Maricopa, California, the aeroplane can deliver the mail in one hour where it now takes fifteen hours and ten minutes.

This is made possible by the fact that the aeroplane can travel in straight line, by the shortest route, and makes every place an aerial port. All other vehicles must follow roads, and they are handicapped wherever there are no roads.

For this reason we may well expect that there will soon be thousands of aeroplanes in use for peaceful purposes on this continent—which will form a valuable aeronautical reserve to be available for the protection of the countries of the Western Hemisphere. Despatches from Europe make us realize daily that, whereas aircraft are the deciding factor and the most effective weapons against submarines, had the nations of the Western Hemisphere ten thousand aeroplanes in use for sport and commercial purposes this continent could be well protected against unpleasant contingencies.

Appreciating these truths and concurring heartily in the sentiment expressed by Mr. Santos-Dumont, the Aero Club of America wishes to assist in hastening the coming of the day when we may travel in the air from Rio de Janeiro to New York and vice versa, making the trip in a few days, and to bring the people of this continent into closer relation through sport. As a first step we take pleasure in announcing through you the offer of a \$5,000 Pan-American Aviation Trophy to be competed for annually by the representatives of the nations of the Western Hemisphere, under the rules to be made by a committee of representatives of these nations, the first competition to take place at Rio de Janeiro as soon as possible. The following competitions may take place in the countries represented by the successive winners of the trophy. A cash prize of \$5,000 is offered with the trophy to go to the winner of the first competition.

The aviators who will fly in this race will be pioneers who will, in the name of sport, open the aerial highways for the people of this continent to travel in. It is hoped, therefore, that each country will give hearty co-operation in the carrying out of this project.

The conquest of the air through dynamic flight has been made possible by Americans. The Wright Brothers, who made the first flight; your illustrious inventor and sportsman, Alberto Santos-Dumont, who, after demonstrating to Europe that the air could be navigated with dirigibles, evolved an aeroplane and made the first flight ever made in Europe and the first public flight ever made in the world; Glenn H. Curtiss, the father of marine flying; Chavez and Bielovucci, who, by flying over the Alps, led the way to the conquest of the mountains—all these pioneers are Americans. Through them the New World has given the Old World wings—a suitable return for the gift of civilization. Santos-Dumont's flight near Paris, Wilbur Wright's flight at Auvours, Chavez's and Bielovucci's flights over the Alps, Curtiss' flights with the hydroaeroplane and the flying boat in Europe—each of

**America Must be Given a Navy Equal to the Best.** If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.



these events may be considered by posterity as being as significant as the discovery of this continent by Columbus.

Assuring you again of the hearty co-operation of the Aero Club of America and its affiliated aero clubs in fostering the development of Pan-American aeronautics, I beg to remain,

Yours very sincerely,

(Signed)

ALAN R. HAWLEY,  
President, Aero Club of America.

The Brazilian Ambassador and John Barrett, director of the Pan-American Union, have accepted the invitation and will come to the Tenth Annual Banquet of the Aero Club of America, which will be held at the Biltmore Hotel, New York, January 12th, at which important announcements will

A committee composed of leading people, including representatives of all the countries of the Western Hemisphere, is being formed. This committee will outline a plan of action which will then be carried out, and will make the rules for the Pan-American Trophy Competition. If it is decided that the competitors must be representatives of the aero clubs of the different republics, then aero clubs will be formed in the republics, and they will appoint the representatives, following the method adopted in the case of the Gordon Bennett Trophy Competition.

The formation of a Pan-American Aeronautic Federation will be a logical result. Such an organization will have work of tremendous importance to do, and if formed, as the International Aeronautical Federation is, of aero clubs of national importance, which count in their membership representative sportsmen, statesmen, scientists and business men, it will become an organization of international importance.

There are twenty-one republics in the Western Hemisphere. They are: The United States, Mexico, the Central American States, comprising Guatemala, Honduras, Salvador, Nicaragua, Costa Rica and Panama; the republics of South America, comprising Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Argentina, Uruguay, Paraguay and Brazil; the island republics of Cuba, Haiti and Santo Domingo. Cuba is now an independent republic.

#### Automobile Engine Experts To Co-operate with American Society of Aeronautic Engineers and Naval Consulting Board

**A** MOST significant development which is to result in bringing the automobile engine experts into the aviation movement to assist and co-operate in solving some of the technical problems has just taken place.

Representatives of the Naval Consulting Board, the aircraft manufacturing interests of the country and experts of the American Society of Aeronautical Engineers had a consultation on December 31st in the Engineering Societies Building regarding the development of the aeroplane for military purposes.

Among those at the meeting were Howard E. Coffin, Thomas Robins and Elmer A. Sperry, member of the Naval Consulting Board; Glenn L. Martin, of the Martin Aeroplane Company, Los Angeles, Cal.; Gerald N. Brower, of the Thomas Brothers Aeroplane Company, Ithaca, N. Y.; H. S. Hubbell, Gallaudett Company, Norwich, Conn.; A. R. Knabenshue, Wright Aeroplane Company; John E. Sloane, Sloane Manufacturing Company, Plainfield, N. J.; Glenn Curtiss, Curtiss Aeroplane Company (by proxy); Howard Huntington, Huntington Aircraft Company, and Secretary of the Aero Club of America; Henry B. Wise and Albert S. Heinrich, of the Aero-Marine Plane and Motor Company, New York; G. C. Leoning, Vice-President of the Sturdevant Aeroplane Company, Boston; J. G. Vincent, Croker F. Clarkson, General Manager of the Society of Automobile Engineers, and Henry Woodhouse, Governor of the Aero Club of America, and Director of the American Society of Aeronautical Engineers.

According to a member of the Naval Consulting Board who attended the meeting the naval and military experts are chiefly interested in the scout flyer, chasers, aircraft of very high speed, the heavy fighting machines and the observation flyers, which have played so important a part in artillery work in the European war. The Government also is anxious to ascertain what the equipment of manufacturers is and their possible output. The question of the supply is regarded as important as the questions of types and qualities of the machines, for in time of need the Government wants assurances that the requirements will be met.

Secretary Thomas Robins, of the Consulting Board, in a statement after the meeting, said:

"Engineering co-operation and standardization in materials, in designs and in specifications were some of the subjects discussed. The aeroplane industry bids fair to develop even more rapidly than the motor car industry. As in the early days of the automobile industry, however, aeroplane builders have to date been working independently and with little engineering co-operation."

It was generally agreed that the construction of military aircraft must be standardized and a committee was elected to consider preliminary plans and invite automobile engine experts to co-operate.

#### Aeroplanes To Be Strongest Factor in Evolving Pan-Americanism

**A**LBERTO SANTOS-DUMONT, the Brazilian sportsman and pioneer in aeronautics, who has never been known to deliver an address or to speak at public functions, delivered his first address on Monday, January 3d, at the Second Pan-American Scientific Congress, held in Washington, D. C.

Mr. Santos-Dumont, who is the man who made the first public flight with a dirigible balloon as well as with an aeroplane, and who spent \$600,000 in experiments to prove that the air could be navigated with dirigibles and aeroplanes, traveled to Washington with Messrs. Emerson McMillin, Elmer A. Sperry and Henry Woodhouse, all of whom were delegates to the Congress from the Aero Club of America and the American Society of Aeronautic Engineers. These two organizations, having been invited by Secretary of State Robert Lansing to send delegates to the Pan-American Congress, and finding that three of the gentlemen selected were members of both organizations, decided to make their representatives joint delegates.

Santos-Dumont's address dealt with the possibility of employing aircraft to solve difficult problems of transportation in South and Central America, thereby bringing into use for peaceful purposes thousands of aeroplanes which would then form a Pan-American aeronautic reserve, which could be used in case of need to defend the nations of the Western Hemisphere.

"The countries of this hemisphere are of one family," said Mr. Santos-Dumont. "To-day they are like the members of a family who live in different houses, in a state of estrangement. The peace, strength and well-being of a family depend upon close association, understanding, sympathy, interchange of views and better facilities for communication and trading relations are vitally necessary. Who knows when some European power may menace an American state? Who can tell if, in the aftermath of the present European war, some power may not reach out to grasp territory in South America? Is war between the United States and a European power to be regarded as absolutely improbable? A more firmly knit alliance between the United States and her Southern neighbors would mean a greater and more formidable strength."

"I have spoken of the difficulties that have retarded the development of commerce, better facilities in transportation and communication, and the fostering of friendly relations. I believe these difficulties are about to be overcome. I feel certain that the present obstacles in time and distance will be surmounted. The isolated cities of South America will be brought into touch with the world of the day. Separated countries will meet despite the barriers of mountains, rivers and forests. The United States and the countries of South America will be brought together as closely as are England and France. The distance from New York to Buenos Aires—which is now over twenty days by steamship—will be abbreviated to a trip of a few days. With time and distance annihilated the commercial relations, so long deferred, will spontaneously develop. We shall have facilities for prompt communication. We shall get into closer contact. We shall become stronger in the bonds of understanding and friendship."

"All this, gentlemen, will, I believe, be effected by the aeroplane. I do not think many years will pass before there will be established aeroplane services between the great cities of the United States and the capitals of South American countries. With a government-owned aeroplane mail service, communication between the two continents will be cut from twenty days to two or three days. The transportation of passengers between New York and the remote points in South America is not impossible. Yes, gentlemen, I believe the modern improved aeroplane will solve the problem with which we have struggled for years. I believe the aeroplane will knit the various States of the continent into an integrally united, co-operating and friendly combination, allied for their own well-being in trade and commerce as well as for strength in times of possible war."

Mr. Santos-Dumont was accorded a most enthusiastic reception by one of the largest audiences attending any of the sessions of the conference.

Mr. Elmer A. Sperry read a most interesting treatise on "The Gyroscope as Applied to Aerial and Water Navigation" which we hope to be able to present to our readers in our next issue.



# THE NEWS OF THE WEEK

## Aero Club's Tenth Annual Banquet

Probably the most important event of its kind ever held in America will be the tenth annual banquet of the Aero Club of America on Wednesday, January 12th, at 6:45 P. M., in the Grand Ballroom of the Hotel Biltmore, Madison avenue and Forty-third street, New York City.

National defense will be the keynote of the speeches of the evening and addresses are expected that will command attention throughout the nation.

The offer of the \$10,000 Pan-American trophy brings Pan-American Aeronautics as one of the four important features of the banquet. His Excellency Domicio du Gama, the Brazilian Ambassador, will be present, together with other representative people from South and Central America. Hon. John Barrett, Director of the Pan-American Union, Alberto Santos-Dumont, and other prominent leaders in the Pan-American movement will follow the Brazilian Ambassador as speakers.

Among the other guests who have accepted at date of writing are Congressman John J. Fitzgerald, chairman of the Appropriation Committee, House of Representatives; Rear Admiral Robert E. Peary, Commodore R. P. Forshaw, commanding Naval Militia of New York; Brigadier-General John F. O'Ryan, National Guard of New York; Emerson McMillin, Henry B. Joy, Russel A. Alger and others.

Mr. Henry A. Wise Wood will be the toastmaster.

Ladies may hear the speeches from the boxes which will be opened after 8 P. M.

The flying boat presented to the Naval Militia of the State of New York, and which was christened by Gov. Whitman's daughter and accepted on behalf of the State by Gov. Whitman, will be on exhibition in the banquet room with the Curtiss and the Gordon Bennett trophies. Among the banquet souvenirs will be a bronze replica of the Curtiss marine flying trophy.

## Wright Graduates Obtain Certificates Abroad

Arthur Roy Brown and Lieut. Harley G. Smith, graduates of the Wright School at Dayton, O., have obtained certificates from the Royal Aero Club of Great Britain. The date of the former is November 13, 1915, and of the latter November 17, 1915.

## American Society of Aeronautic Engineers

The directors of the American Society of Aeronautic Engineers will hold a meeting at 297 Madison avenue on January 13th, the day after the annual banquet of the Aero Club, at which the resignation of Henry A. Wise Wood, as a member of the Naval Consulting Board, will be received and acted upon.

Applications for membership have been received from thirty persons and special blanks on which to make the applications in the required form have been sent to the applicants.

The annual convention of the society is to be held in May and leading authorities are preparing important papers to be read at the convention.

## Curtiss School Opens at Newport News

The Atlantic Coast Aeronautical Station was formally opened at Newport News on December 27th, under the personal charge of Capt. Thomas S. Baldwin, when Victor Carlestrom made a high flight over the city and Walter E. Less, who is in charge of the flying boat division, took the boat out for a little spin around the bay and along the river front. Mr. Less, who was instructor on the flying boat in Buffalo for the Curtiss people, says that Newport News is one of the best places he ever saw for a flying boat school. The combination water and land hangar is on Boat Harbor Point, almost directly across from

Norfolk, and only a few miles from Old Point Comfort. One can fly for ten miles around without being out of sight of the hangar. Mr. Less has been at Newport News since September, when he took the place of Al Engle, who at that time went to Spain on a mission for the Curtiss Company.

Late reports from the school are to the effect that Vernon Castle is throwing himself into the study of aviation with all the will that he devoted to dancing. While he "goes to school" in a Marmon racer and is accompanied by a Swiss police dog, he makes a swift change to suitable togger and works hard at the mechanical tasks.

## Curtiss Interests Bought by Syndicate of Financiers

Stock control of the Curtiss Aeroplane Company and the Curtiss Motor Company has been bought by a syndicate headed by William Morris Imbrie & Company, and a new company will be formed to take over these concerns. It will be called the Curtiss Aeroplane and Motor Company, with \$6,000,000 7 per cent. preferred stock. \$3,000,000 6 per cent. notes maturing in installments of \$1,000,000 each in twelve, fifteen and eighteen months, and 150,000 shares of common stock without par value.

The notes and preferred stock will be offered to the public at prices not yet determined. The common stock will go as a bonus with the other securities. It is understood that Glenn H. Curtiss, head of the companies, will be president of the new organization and will retain a substantial stock interest.

The Curtiss concerns have an aggregate capital of \$3,000,000, and it is understood that Mr. Curtiss received approximately this amount from the syndicate, taking payment in part in stock. The new concern will take over contracts for aeroplanes and engines amounting to between \$13,000,000 and \$15,000,000, which were so drawn as to be impossible of cancellation. Most of the work in hand is for the English and French Governments. Last year gross earnings were in the neighborhood of \$5,000,000.



Left to right Ellis H. Cowdin, Norman Prince and William Thaw, 2nd., the three Americans who have rendered such excellent service to the French Aviation Corps.





Miss Marjorie Stinson, an instructor at the Stinson School of Aviation, San Antonio, Texas.

#### A Splendid Record at the Wright Aviation School

The establishment of the Wright Aviation School at Augusta, Georgia, was inaugurated under most favorable circumstances. The school opened there on December 20th, 1915, with eighteen pupils, and Howard Rinehart, Esq., as chief aviator, and William B. Atwater as assistant.

By January 1st, 1916, 1261 minutes in actual flying had been given the pupils, and five of the pupils had successfully passed the test for their license certificate, issued by the Aero Club of America. Those passing their license tests were:

P. S. Kennedy	J. A. Shaw	L. Breadner.
W. H. Chisam	R. M. Weir	

We believe that this time record and test passing by the pupils is the record for all flying schools for the same length of time.

After a long and exhaustive search of the South, Augusta was finally chosen by the Wright Company for the location of their school on account of its fine climate and weather conditions, and the excellent results obtained in the first fortnight there predict great possibilities for the future of the school. A sixty mile gale was sweeping over the Eastern States for two days at Christmas time, and, therefore, the showing made at the school was all the more remarkable.

#### Declined to Intern Thaw and His Comrades

The State Department at Washington declined to interfere with the vacation of Lieut. William Thaw, Sergt. Elliot Cowdin and Sergt. Norman Prince, American members of the French Flying Corps, who came here to spend a vacation of eight days, expiring with January 1. Two unofficial demands from German sympathizers were made upon Secretary of State Lansing for the internment of the three Americans, but the Secretary declined to act. The State Department held that although the three have relinquished their American citizenship by joining the French army, they are in the United States unarmed and on a peaceful mission. If they attempt to obtain passports to return, these will be denied, but they were presumed at the time of the decision to have French passports which made American passports unnecessary. When they return to this country, they automatically resume their citizenship.

The German protest declared the escape of the three would "constitute a grave international offense" and that the United States would be responsible for the damage caused by them.

#### W. D. Judkins Goes to Europe

Mr. W. D. Judkins, vice-president of the Sloane Manufacturing Co., sailed for Europe recently. He will visit England, France and Italy, where he expects to secure large orders for the new H-1 type Sloane Military Tractor, described in the last issue of Aerial Age.

#### England's Answer to the Zeppelin

Charles H. Day, of the Sloane Aeroplane Company, returned last week from Europe, where he has spent some time on work in connection with government contracts. Mr. Day says that England's answer to the Zeppelins of Germany is a giant aeroplane, of 800 horsepower, which carries a crew of nine men and some great guns. Though declining to go into the details of its construction Mr. Day said that this machine had been tested out and found to be satisfactory. Its size may be judged from the fact that when Mr. Day entered the cabin he found that he could not only stand erect, but that the ceiling was several inches above his head.

Mr. Day visited the leading English and French aerodromes. In the aircraft of the Allies four types predominate and have given the Allies mastery of the air in the Western theatre of war. These types, he said, include a fairly fast, stable aeroplane, equipped with wireless, for artillery fire control; a fast cruising machine, with a speed of from ninety to a hundred miles an hour and carrying two guns, to drive off German aeroplanes and Zeppelins; a fast scout machine with a speed of more than one hundred miles an hour, carrying one or two men and a small gun for defence, and a bombardment machine, with a comparatively low speed of sixty miles and tremendous lifting capacity. The last named class, he said, could carry a large load of explosives and mounted guns of as large a calibre as two inches.

The British government test of the Sloane aeroplane was very satisfactory to the Sloane company, as it revealed to the government officials its points of excellence. Control, speed and stability all came up to the requirements. The mean speed obtained in three runs was 84.7 miles an hour, and the climbing record was 3,000 feet in 7m. 27s. The motor was stated to be reliable and the pilot's view good.

"This was a very satisfactory performance for a machine of this horsepower and carrying capacity," was the summing up of the official report.



The latest Huntington Tractor Biplane.



### Mr. Inglis M. Uppercu Presents Hydro to New Jersey Naval Militia

Mr. Inglis M. Uppercu, head of the Aeromarine Plane and Motor Co., of Nutley, New Jersey, has presented one of the latest model Aeromarine hydroaeroplanes to the Naval Militia of New Jersey. It will be equipped with a 90 H. P. direct Aeromarine motor. Mr. Uppercu was formerly a resident of Newark, and he has donated this machine to his native State as a demonstration of his patriotism, which is cordially appreciated by the men of the aviation squadron, as well as by the citizens of the State. We hope to present a picture of the machine in our next issue.

### Pennsylvania Club Has an Unusual Privilege

The membership card of the Aero Club of Pennsylvania will admit members to the League Island Navy Yard, Philadelphia, after the usual closing hour. The courtesy is unusual and the club requests that members who take advantage of it scrupulously observe all the rules and regulations laid down for the conduct of visitors.

At the last regular meeting of the club, held in Bellevue-Stratford on December 17th, Baron von Figgelmessy, who had been injured in an accident at Allentown on August 28th, was present. He has recovered and his long stay in the hospital has in no wise dampened his enthusiasm as an aviator.

Official consent has now been received from Washington for the erection by the club of a hangar on the League Island Navy Field. It is expected that the necessary fund will be completed soon, and that the hangar will be erected in the near future. It is likely that one hangar large enough to hold three planes will be constructed, but there is also a possibility that the plan may be changed and one or two smaller hangars may be constructed.

Glenn Martin, head of the Glenn Martin Aeroplane Co., and Bert Scott, of the Hall-Scott Company, were elected to membership. Capt. R. L. Russell, recently appointed commandant of the League Island Navy Yard, was elected a service member of the club.

### The Stinson School of Aviation

Fourteen pupils are at present enrolled in the Stinson School of Aviation at San Antonio, Texas, and others will take up instruction there as soon as they are notified by the management that they will be accepted.

The Stinson School is unique in that three women are actively engaged in its work—Miss Marjorie Stinson, who flies; her mother, Mrs. Stinson, who is business manager, and Miss Katherine Stinson, who is at present making an exhibition tour, but who will soon resume work there as an instructress. Edward Stinson, brother of the bird woman, is the head mechanic. He, too, has been flying for several months and recently obtained his license.

The Stinsons have just acquired a new flying field, are about to erect a hangar large enough to house four planes and quarters will be provided for the pupils. The Army post drill ground has been used as a flying field in the past, but as that is public property, the work of teachers and pupils has been to some extent hampered by the presence of crowds of spectators.

Among those attending the school or who have recently completed courses of instruction are: A. York Wilks, W. Norman Brown, Herbert McKenzie, Joseph Gorman, L. C. Angstrom, J. A. Harman, Marcel Dubuc, Gordon S. Harrown, Paul O. Gadfois and Jack E. Walker.

### Celluloid Wings for Aeroplanes

Attempts have been made to construct aeroplanes of material that is practically transparent. One experiment along this line has been an aeroplane with non-inflammable celluloid for wings, and a new muffling box to deaden the sound of the motor. When flying at a moderate elevation it is difficult to see or hear such an aeroplane. The advantages of a semi-transparent aeroplane in warfare are that it enables the aviator to reconnoiter the enemy at close range and with little danger from gun fire.

### The Elkhart Mfg. Co. Working to Capacity

The Elkhart Manufacturing Co., of Monroe, Michigan, manufacturers of alternating current Magnetos both high and low tension for stationary marine and motorcycle engines, report that they have closed contracts for enough business to keep them running to full capacity for at least a year.

Mr. E. M. Ford, salesmanager of the corporation, advises that the outlook, from a magneto point of view, is very promising. The majority of this business is for engines of the motorcycle type, although a considerable amount of it is

for stationary and marine engines. The officers of the Elkhart Manufacturing Company feel quite pleased at the recognition which this business shows of the superior article that they have been manufacturing for some years past, and demonstrates to them that an article which is made by experts, as a specialty and constructed of high-grade materials, will in the end win approbation from the general manufacturing public.

### Aviator's Certificates

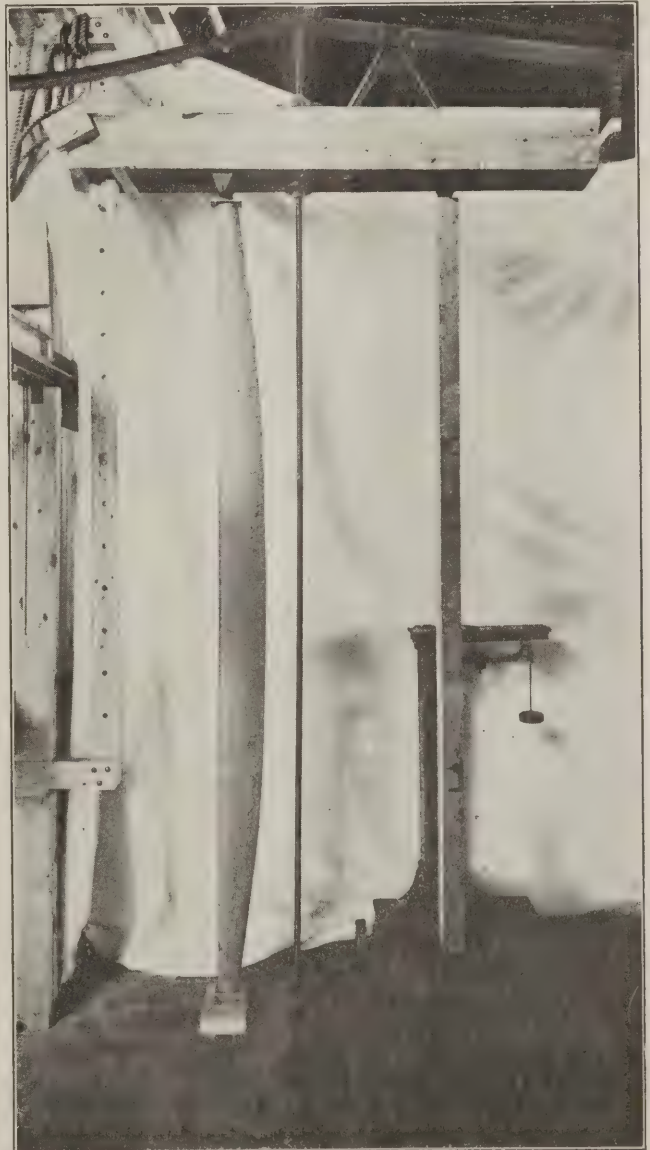
The Aero Club of America has granted aviator's certificates to the following persons:

Expert—No. 46, Lieut. H. T. Bartlett, U. S. N.

Hydroaeroplane—No. 42, A. Livingston Allan; No. 43, William F. Sullivan; No. 44, Walter E. Lees; No. 45, Edward Hubbard.

Aviation—No. 354, Albert D. Smith, Corporal; No. 355, Harold Emile Jensen; No. 356, Murray Bayne Galbraith; No. 357, Arthur Gerald Woodward; No. 358, Walter James Sussan; No. 359, John Clark Simpson; No. 360, James S. Krull, Corporal; No. 361, Arthur Roy Brown; No. 362, Harley G. Smith; No. 363, Cuthbert J. Creery; No. 364, John Galpin; No. 365, Basil Duncan Hobbs; No. 366, James Lindsay Gordon.

Upon the request from the Royal Aero Club, sanction was given to the issuance of pilot certificate to Niels Sorensen Bangs, an American subject.



Strut and beam tests at the Curtiss plant. The upright to the extreme left having a series of holes is a guide post. The fish shaped piece is the ten foot "T" strut. The long slender piece is the straining rod. The wooded rectangular upright transmits the load to the platform scale. A load of 6,000 pounds was applied to the strut. It first buckled backwards and then sidewise, giving a beautiful bow. Due to the proper proportionings of the sections the bow was an arc of a circle.



# AVIATION'S NEW OPPORTUNITIES

By W. B. STOUT, Chief Engineer, Scripps-Booth Co.,  
Detroit, Founder of Model Aero Club of Illinois

THE automobile industry is choking itself on the congestion of its own prosperity; the aeroplane is developing toward perfection at an astounding rate. As automobile congestion becomes more of a problem, flying becomes less of a danger. There will come a time, and soon, when man will take to the air for his transportation-recreation and when the aeroplane will come into its own. This impending revolution is aviation's new opportunity.

We of this club have been in touch with aviation development since the Wrights first flew—and some of us before that—and have stood by while the first crude Wright machines and the Bleriot have developed. We have rejoiced with the initiative of America from Langley to the present date and have railed at the inconsistencies of some of the amateurish attempts which have been perpetrated by well meaning ones while aviation was looked upon as an impractical hair-brained study.

The world war has waked up aviation again and at last the flying machine is to be a commercial thing. You workers of the Aero Club of Illinois and especially the young men of the Model Aero Club, stand ready to reap the reward for the years of interesting work put in at this most interesting of all engineering accomplishments.

The week-end tour by automobile is fast losing its pleasure. Roads are better it is true, but speed laws are every year more restricting; motor cars are better than ever, but the roads even today, are overcrowded and one spends the week-end in the dust of the cars ahead and in the stench of his neighbor's carburetor. What will be the condition three years hence when there will in all probability be on the roads twice the number of motor vehicles at present in use? It takes little imagination to see that man very shortly will have to look to a new transportation for his pleasure journeys as the first step toward the development of this new thing to commercial work.

There is another reason for the loss of interest in week-end runs. Here in Chicago you are restricted to two or three good main roads for your runs out of town, and in fact must choose a run into Indiana out over a road which you are tired of for thirty miles, if you would go at all in comfort, for road conditions in other directions are almost prohibitive. We in Detroit have a choice of five good roads, mostly concrete, but all of which we have been over scores of times so the first twenty miles, at least, of any trip is almost boring when one is in the mood for new sights.

New roads are being built and new ways perfected, but not so fast as the motor car is growing, and these conditions will not improve. We want new trips out of Detroit for our recreation tours and you want new lanes out of Chicago. You can have this and never duplicate a journey if you go by aeroplane.

The aeroplane in its developed state would decide many of the problems we confront today, provided the plane were fitted to living conditions and commercial requirements.

The aeroplane of today compares with the plane of eighteen months ago as the curved dash Oldsmobile to the Packard twin six or the Scripps-Booth roadster. The war has perfected the aeroplane in this short time to a greater degree than the motor car was developed in any ten years of its growth.

Several years were taken to prove to the public that the motor car would run at all without a horse in waiting. Years were taken to educate the public to two cylinders as against the single, and to four as against the two. Years more were spent in educating the buying public and developing the six and now we are preaching eight and twelve. It has taken years to develop the light weight idea in motor cars and the improvement of streamlining for body design. The public has held back the development of the motor car.

The aeroplane in contrast has been developed by governments under war conditions. If the rotating Gnome failed to qualify, the advertising of a manufacturer could not save it. It was discarded. If the motor-car type of motor proves best under war conditions, it is adopted; and motors of today for aeroplanes are of twice the horsepower of those used a year ago, while planes have been built up to one thousand horsepower in five motor units. These machines land at under thirty miles per hour and travel well over a hundred in the air. They have a range

of speed that makes them safe vehicles even under war conditions. You notice our own Norman Prince has been mentioned twice in the French dispatches and is still alive. We expect some wonderful tales when he gets back. Andre Ruel is also flying at the front—though his work here was mainly "military"—at least, he is in the aviation corps. These are learning new things about aeroplanes and design in actual war conditions. This military development has perfected much in small time.

Thus war has developed motors and planes, and we but wait for the moment when aviation shall arrive in the minds of the public.

This will take advertising in a campaign of tours and contests covering the country. It will take development of the war machine to fit public demands and psychology for safety. The time, however, is close at hand—just as close as the ending of the war.

Suppose the war were to close in a year from now. By that time there will be from ten to fifty thousand aviators fully trained to flying under all conditions, who will suddenly at the war's close find themselves out of work.

There will be a hundred factories of large production suddenly left without a market. There will be motor makers without an outlet for product. These factories will at once be forced to start an extensive campaign to bring the advantages of flying before the public and to convince them of its safety. The makers will probably get together into an association as have the motor car manufacturers, to plan ways and means for the best development of the industry. They will promote cross-country tours and races, as in the days of the early motor car campaign, except that in this case speed will always be an object, as it promotes safety once one is in the air, and there will be no speed laws except in landing. This idea of speed and safety will be part of the campaign. The aerial taxi scheme will also be an early plan, while the papers will be filled with advertising, aiming to popularize the new transportation.

Millions are invested in aviation; when the war stops we will have to spend much to keep these millions a working investment, and with the assistance of the available aerial chauffeurs will undoubtedly succeed in popularizing the art of flying.

The campaign of advertising alone, however, will not put over the big, expensive, military, weight-carrying machine, as a popular air-car. The public does not want a 500-horsepower machine to carry ten passengers. What it will want will be a machine fitted to public psychology from every standpoint and with a decided appeal as a step in advance in transportation.

The war machine must carry many men and much weight of arms and explosives, and must fly at speeds around one hundred miles an hour. It must follow certain specifications which have been found best for war purposes. The flying machine for the public must be one which has taken all the points of advantage learned in the war and has adapted them to peace uses, probably in a new design. The big military bus will do for carrying sightseers, but it will hardly do for family use.

In the first place it takes a hangar of enormous size and must start up from a big field. Its running expense is high and it is prohibitive for the average man.

My prediction may sound radical, but I believe that after the war the small machine will come into its own. We know that it is possible to get off the ground at twenty-five miles an hour with two passengers and with a thirty-five horsepower motor. We know also that theoretically the same motor could drive up at a hundred miles an hour, once we were up, if we could reduce the head resistance and surface enough. Eventually, I believe a machine will be available which will leave the ground at twenty-five miles an hour and climb at a steep angle, whose planes can be changed while in the air to allow a speed of one hundred miles an hour, and which can change back to a speed which will allow of a "pancake" landing in a small lot. This machine will have a light but efficient motor of from fifty to one hundred horsepower and will carry four persons.

This machine will of necessity be designed to appeal. It must be beautifully finished and travel noiselessly. The passengers must be enclosed completely for the high speeds involved, and navigating instruments must be fitted for all occasions. Conversation must be possible aboard while in flight, and the machine must look and sound safe as well as be safe, through its simplicity and its slow landing speed.

The development of such a machine is aviation's new opportunity, and the new opportunity of those who are experimenting to be ready when America is ready for aerial transportation.

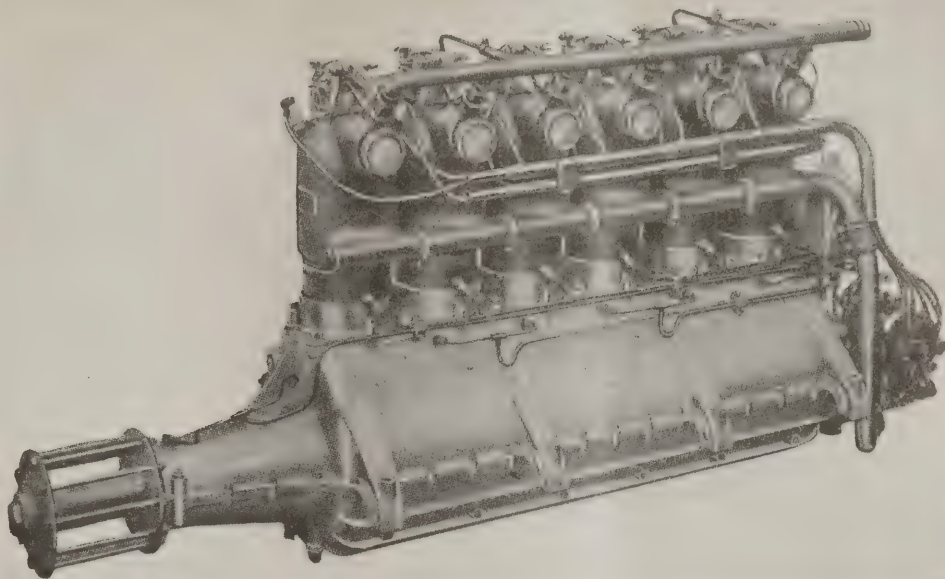
You of the club have machines of this type in mind. One of your number is developing a wonderful motor, another has some new data on small planes which just fits into the development I have maintained, while our fellow-worker, Emil Laird, of the Model Club, has proved how efficiently a small machine can fly compared to big constructions, and how safe it is.

This talk has but touched the surface of the sea of ideas and opportunities about to open up for aviation, but bear in mind again what I said at the beginning.

The automobile is a decreasing factor in pleasure transportation and is choking itself on its own prosperity. The aeroplane is fast arriving as a safe transportation vehicle with a real appeal. It only remains for you to perfect what we know now of the flying machine into a vehicle in which all will feel safe, and which will have a definite sporting appeal to reap the benefit of conditions that now impend.



## THE 120 H. P. BEARDMORE AUSTRO- DAIMLER AERO ENGINE



THE production of a successful aeroplane engine is a matter of years of experiment and practical experience, and since the first appearance of the Austro-Daimler engine in the earliest Etrich machines, the steady progress in design has been emphasized by their remarkable success in international competitions. The well-known designer, Herr Ferdinand Porsche, is the original designer of the Beardmore Austro-Daimler engines. The high-powered recent models are giving excellent satisfaction in machines doing constant duty at the front.

### *Specifications.*

**Cylinders:** Six in number are cast separately and set desaxé. There is a main crankshaft bearing between each cylinder.

**Cylinder dimensions:** Bore, 130m/m.; stroke, 175m/m.

**Weight:** Of standard type with Radiator, Propeller Car-

rier, Wiring magnetos, water and oil pumps, and piping does not exceed four and a half pounds per brake horsepower.

**Revolutions:** Normal, 1200 revs.

**Lubrication:** Pressure feed (Friedman patent) with valveless piston pumps. A sight gauge fitted to the oil reservoir. Valves in the head of the cylinders, operated by push rods and overhead rockers. Special laminated springs are used for the valves.

**Ignition:** Two independent high-tension Bosch ignition magnetos (dust and waterproof type) are used. An electrical self-starter is incorporated with one magneto system.

**Carburetor:** Two carburetors (synchronized) are used of a special automobile type with rotary sleeve. They are hot water-jacketed and designed so that it cannot catch fire.

**Cooling System:** A light-weight honey-combed radiator with centrifugal pump, and the cylinders are fitted with electrically deposited copper waterjackets.

**Consumption:** Petrol 6 pints per h.p. per hour and oil .025 pints per h.p. per hour.

The price, including tools and spare parts, \$5,250.

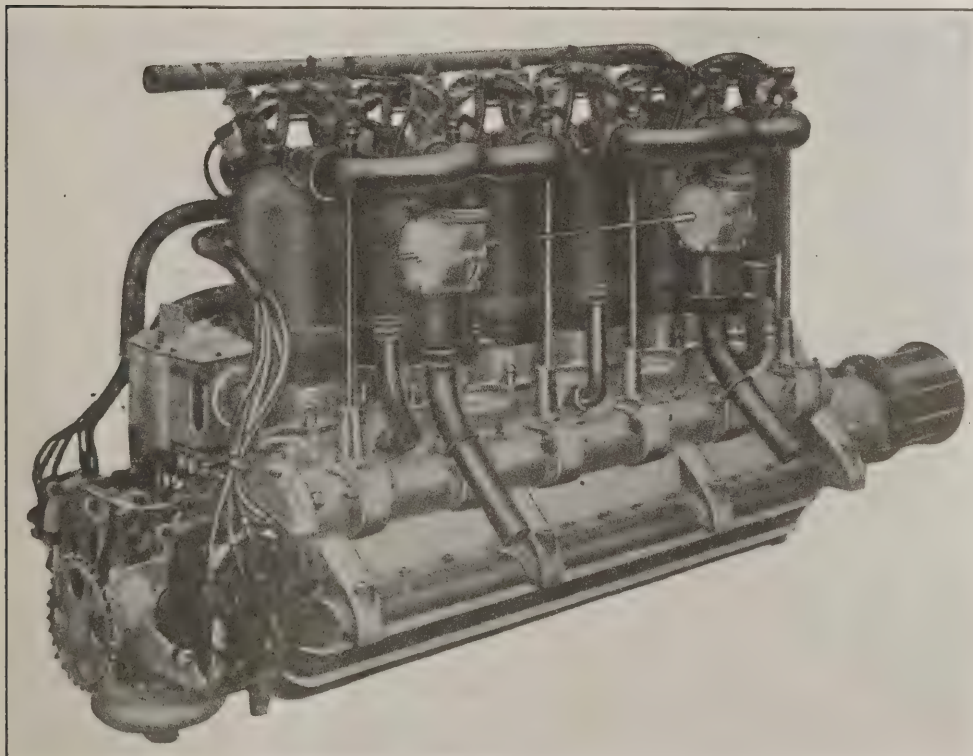
### *Constructional Features.*

The pistons are made of pressed steel, combining extreme lightness with great strength.

The crankshaft is supported on seven main bearings with great rigidity and freedom from vibration.

Bosch patent forced feed lubrication by means of valveless piston pumps delivering fresh oil to main bearings and cylinders is the system adopted. The unique feature of this system is its efficiency even against a pressure of 1,000 lbs. to the square inch.

The design of the crankcase permits of the lower portion being removed for the inspection and adjustment of the bearings without disturbing the crankshaft. The crankcase is extended to receive the double thrust ball-races, which are fitted to the propeller end of the crankshaft.



Inlet side of 120 h.p. Beardmore Austro-Daimler Aero Engine



## TWO WIRELESS SETS FOR USE ON AEROPLANES

THERE were two sizes of wireless sets for use on aeroplanes in the French army and navy at the beginning of the war. The smaller of the two had a range of about 62 miles and weighed complete about 77 pounds. The larger set, weighing about 105 pounds, had a range of 124 miles.

The aerial consists of a bronze cable about three sixty-fourths of an inch in diameter, having at its loose end a spindle of sufficient weight to cause it to unroll from the drum and to give the tension required. The aerial is cast loose after the aeroplane has taken flight and owing to the weight at its free end, and the speed of the machine, it trails in a nearly horizontal position, offering so little resistance to the air that this feature is negligible.

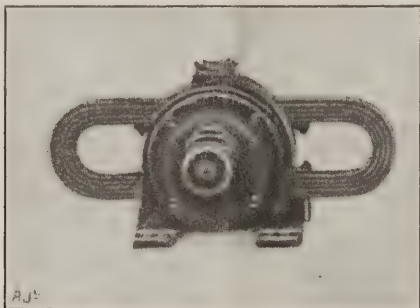


Fig. 1. Bethenod Magneto-Alternator

Ordinarily this cable is wound on a spool with insulated sides and handle, and the spool is fitted with a circular commentator so arranged that the cable may be wound or unwound without interrupting the operation of the apparatus. It also permits the rapid tuning of the different circuits. A cutter with insulated handle enables the operator to instantly sever the cable in case any situation should arise wherein the trailing wire would be a menace to the safety of the machine.

The "earth" connection is effected by an electrical capacity consisting of all of the metallic parts of the machine being connected together electrically. The metallic parts, which are insulated from each other, or in which the contact is poor, should be carefully joined by means of very small electric connections.

The aerial is indirectly excited by means of a musical note transmitter consisting of a generator, transformer, oscillating circuit and manipulating key.

The generator consists of a special Bethenod magneto-alternator having an output of 350 watts, low tension, and giving 800 sparks per second. This alternator, Fig. 1, does not have any current collecting rings or commutator, and as a result it is extremely strong and simple. The generator is driven from the aeroplane motor either by a friction drive or by gearing.

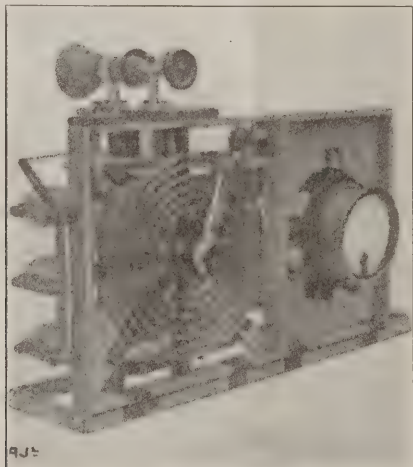


Fig. 2. Oscillating Circuit.

For the larger set a special Bethenod resonance alternator, as illustrated in Fig. 4, is provided, and it is driven from the motor in the same way that the smaller set is driven.

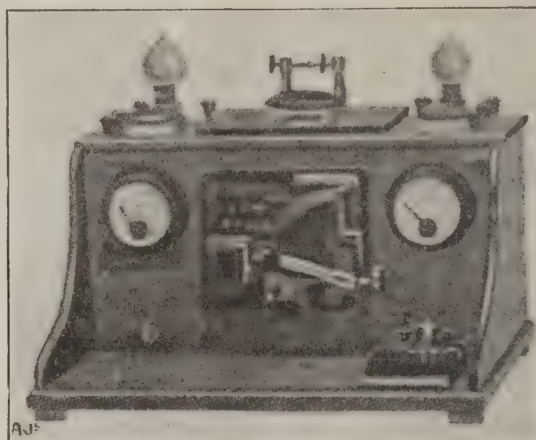


Fig. 5. Wireless Set for Use with Accumulators

This generator has a normal output of 750 watts, 1,500 cycles, at a speed of 4,500 revolutions per minute. Generally speaking, this generator is of the same type as those used in land stations and portable military stations.

The oscillating circuits, Fig. 2, of both sets are arranged so as to give a wave length of 400 metres, and consist of a condenser, having a capacity of 1/100th microfarad, and a spark gap, which in the smaller set is of the point and plate type; while in the larger set, Fig. 2, the electrodes are in the form of a tube and a plate, which is fitted with a special ventilating arrangement. A high frequency ammeter is also connected in the circuit.

The aerial for the larger set is similar in general design to that used with the smaller station, as is also the variometer, which allows the wave length to be instantly varied in a continuous manner without interrupting the operation of the transmitter; and transmitting is effected on the low tension primary circuit, by means of a light sending key, in both sets.

With certain modifications these two types, which have been designed primarily for use on aeroplanes, may be used on seaplanes. As the seaplane station must be capable of being operated while the plane is on the water an independent source of supply of energy is the first requisite to maintain communication while the motor is shut down and a new scheme is also necessary for the aerial.

To furnish power when the seaplane motor is still, a light water-cooled single-cylinder motor, developing 1 B.H.P., and weighing 20 pounds, is provided with the 62-mile set, while the motor for the 124-mile set weighs 39 pounds, has two cylinders and develops 3 B.H.P. In both sets the motor drives the alternator by means of a belt.

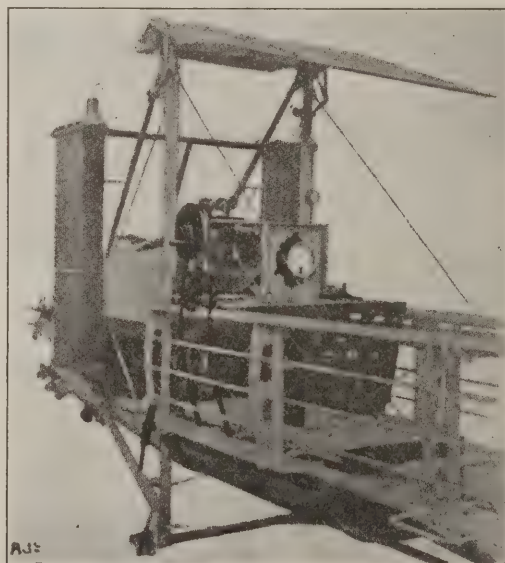


Fig. 6. Wireless Set Mounted on Aeroplane



The receiving sets weigh about two pounds, and are fitted with both crystal and electrolytic directors and very sensitive loud-speaking double headgear telephones to enable the operator to receive signals when the motor is running. The 'phones are also combined with the aviators' helmets in order to facilitate reception.

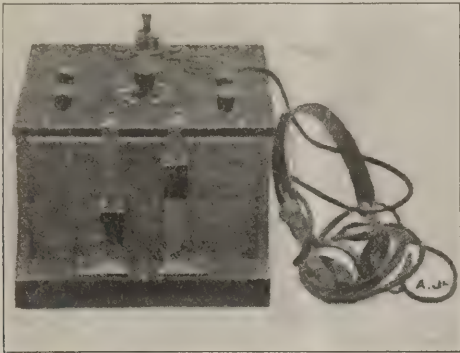


Fig. 3. Receiver

When the machine is in the air the aerial, a cable is unrolled beneath the craft, but when the plane is on the surface of the water the end of the cable is attached to a special type of box kite, of very small dimensions when closed, but when opened has a surface area of 80 sq. ft., which is sufficient to keep it up even in a very light breeze. The kite opens quickly, and there is nothing for the operator to do but to

fasten the end of the aerial to it and allow it to unwind as he descends. This box kite arrangement gives a much longer range than is possible while the seaplane is in flight.

Where it is undesirable to install an auxiliary motor it is possible to have an equipment consisting of a musical vibrator, Fig. 5, with its condenser, an induction coil, spark gap

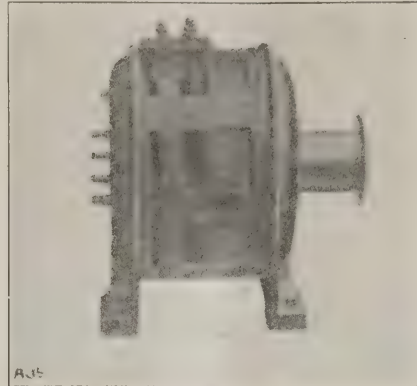


Fig. 4. Bethenod Resonance-Alternator

with point and plate electrodes, sending key, etc. The energy in this case is furnished by a battery of accumulators of light weight, which supply current for the set for a period of ten hours continuously, and the total weight of the set would be 70 pounds. The output of this apparatus is 50 watts, and it is possible to transmit about 50 miles during the daytime.

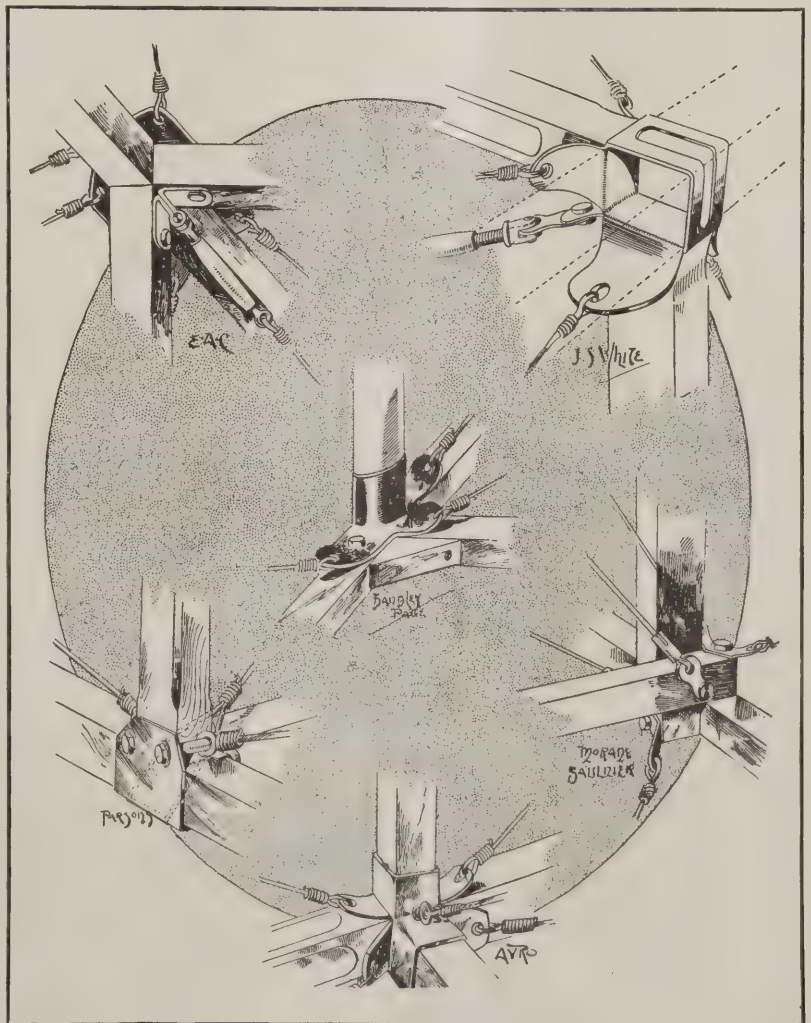
## Fuselage Joints, Without Piercing

SOME of the numerous methods whereby body struts and cross members are attached to the longitudinals are shown in the accompanying sketches, in the series illustrating constructional details.

Because of the three members mentioned the longeron takes the greater part of the strain, designers avoid piercing this member whenever possible. They have, instead, evolved various methods of gripping it instead of drilling holes. And wherever gripping has been found to be impracticable extra thicknesses have been provided in the longeron to compensate for the weakness that results from the holes.

Besides forming a support for the struts and cross-members the fuselage joint provides an anchorage for the diagonal cross bracing, which gives rigidity to the whole structure. Sometimes this object is attained by an integral portion of the main fitting; in others a special clip, often in the form of a chain link, is used. Strength is of course the main object sought in the various styles of fuselage joints, but the cost and the rapidity of manufacture are also important in determining the adoption of any method, especially among constructors abroad, to whom just now every detail making for speed in construction is of the highest importance.

The various points of advantage in these five types which have been selected from as many different foreign-made machines are discernible almost at a glance. All are of such simple design that their construction, no matter what the composition selected may be, should be a comparatively short process.



Connecting Cross Members to the Longerons of the Fuselage.





# FOREIGN NEWS



## INDIA

A fund is being raised by subscription in the Punjab to provide seven aeroplanes to be named after the big rivers in the Province, and all the districts of Northern India are said to be subscribing freely. The Maharajahs of Nabha and Jind and the Rajah Faridkot have each given an aeroplane estimated to cost \$25,000 each. The Rajkumar Hari Singh, the commander-in-chief of the Kashmir Army, has given \$50,000 for two aeroplanes. The fleet thus brought into existence will be used primarily in territory where Indian troops are engaged.

## FRANCE

The gunfire of the French in the Balkans has been made more effective through the wireless corrections sent to the commanding officers by aviators reconnoitering the enemy's lines. Despite numerous difficulties, such as landing grounds and a mountainous country, French aviators have succeeded in carrying on reconnaissances about ninety-three miles into the interior of the Bulgarian lines. In the month of November alone there were fifty-four reconnaissances during which observation and numerous photographs useful in strategic movements were taken. Aviators bombarded cantonments in Uskub, Istip, Kara, Hodzali, Strumitza and Petric. These bombardments were very effective.

Paris no longer fears air raids as she did a few weeks ago and the military governor has announced that he is of the opinion that the city might be more brilliantly lighted without adding to the risk.

In the French army of the Orient aeroplanes on Dec. 29 bombarded the encampments of the Bulgarians at Petrick, east of Lake Doiran.

Comines, a town of 14,000, lying on the Franco-Belgium border, and bisected by the River Lys, was bombarded last week by a fleet of sixteen allied aeroplanes. Bombs were dropped on the station, the railroad lines, and the sheds in the vicinity. Ten aeroplanes also concentrated their attack on the aerodrome and inflicted considerable damage. Both squadrons returned to their own lines in safety.

On the same day there were encounters with twelve hostile aeroplanes, one machine of the Allies engaging in battle with four of the enemy. One of the hostile planes is thought to have been brought down, another was damaged and the others were driven off. Two enemy aeroplanes engaged an aviator of the Allies and brought him down.

Sergt. Georges Madon and Corporal Rene Chatelain, French aviators have reported to their commanders for duty after a prolonged absence in Switzerland. The two aviators had been interned at Zurich, but after carefully laying a plan for freedom they escaped to Evian on the French side of Lake Geneva. On the day of their escape the two Frenchmen readily obtained permission to take a stroll under guard of a soldier of the Swiss Landsturm named Wuest, in the vicinity of the place where they were interned. Accordingly, they started out, accompanied by a fox terrier, which later played a part in their escape. The guard, not suspecting any ruse, led them to a copse. There, according to a pre-arranged scheme, Charles Beck, a French territorial soldier on leave, whose acquaintance the aviators had made, awaited in civilian clothes with an automobile. Wuest was stunned, bound and bundled into the automobile. The others jumped in after him and speeded to Ouchy, on Lake Geneva, by way of Berne and Friburg. At Ouchy they embarked aboard a motor boat previously hired by Beck and left shore under the eyes of a Swiss gendarme, who made no attempt to stop them, the presence of the fox terrier leading him to believe the men in the boat were civilians. The trip to French territory was made without further incident.

## GREAT BRITAIN

Lieutenant Rogers, of the Royal Flying Corps, was killed at Portsmouth when his aeroplane, which was flying at a low altitude, suddenly tilted forward and plunged to the earth.

An official statement tells of an unsuccessful aerial raid in the western theatre of war last week. It says: "The enemy made an unsuccessful attack on one of our aerodromes. Of four machines only two reached their objective. No damage was done. One of our aeroplanes was shot down."

## GERMANY

Germany announced the destruction or capture of three British aeroplanes in recent operations. The official announcement says that the British lost two aeroplanes Dec. 28. One was forced to descend at a point to the north of Lens. The other, a large battle aeroplane, was shot down in an aerial battle north of Han. On December 27 a third British aeroplane was destroyed by fire west of Lille.

On the whole Western front artillery and aeroplanes have been active. The enemy's aircraft attacked the towns and railroad stations of Wervick and Mening Belgium. No military damage was inflicted, but seven civilians were wounded and one child was killed. A British aeroplane was shot down in a fight northeast of Cambrai.

A dispatch from Calais says that a German aviation lieutenant, accompanied by his mechanic, deserted with an aeroplane. They flew over the Dutch border, being greeted by volleys from the frontier guards, and landed at the village of Aardenburg. They have been interned at Flushing.

Allied aviators made an attack on Ostend, last week. No damage was done to military establishments, but buildings were shattered. The heaviest damage is said to have been inflicted on the Convent of the Sacred Heart. Nineteen Belgian civilians were wounded and one was killed.

## GREECE

The first attack on the Allies in Greece came by the way of the air. German and Bulgarian aeroplanes attacked the Allied forces north of Salonica and dropped a shower of bombs. The aeroplanes evidently operated from a base at Ghevghel, which is forty miles north of Salonica. The allied forces in the Balkans are well equipped with both aeroplanes and high-angle guns.

Through an error a French aeroplane returning from a reconnaissance on the last day of the year dropped a bomb on the Greek Camp near Salonica, wounding one soldier. The French commander made suitable explanations. A news agency despatch received by way of London on Friday night said that during a raid over Salonica by a Teutonic aeroplane a bomb was dropped on the Greek camp, just outside the town, killing a shepherd. It was stated that the Greek camp apparently was mistaken for Entente headquarters.

## TURKEY

Turkish artillery brought down a biplane last week that was flying over Yeni Shehr and Kum Kaleh. It fell into the sea in the vicinity of Tekke Burnu and Sedd-ul-Bahr.

A Turkish seaplane made reconnoitering trips over the islands of Lemnos and Vavro on December 27. At Mudros it dropped bombs on a harbor tool house and set the building on fire.

One of the Turkish aeroplanes successfully dropped bombs on a hostile camp near Sedd-el-Bahr on the night of December 31 and on a transport. Other aeroplanes dropped bombs on the armed British ship Swiftsure.



Second Lieut. William Thaw's Caudron Biplane, Serving in the French Army.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

### THE AERO SCIENCE CLUB OF AMERICA

29 West 39th Street New York City  
PACIFIC NORTHWEST MODEL AERO CLUB

915 Ravenna Boulevard, Seattle, Wash.

LONG ISLAND MODEL AERO CLUB  
401 Grant Avenue, Cypress Hills, L. I.

BAY RIDGE MODEL CLUB  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

### DETROIT AERO RESEARCH AND MODEL CLUB

c/o William P. Dean, 1717 Concord St.,  
Detroit, Mich.

### BUFFALO MODEL AERO CLUB

c/o Christian Weyand, 48 Dodge Street,  
Buffalo, N. Y.

THE ILLINOIS MODEL AERO CLUB  
Room 130, Auditorium Hotel, Chicago, Ill.

TEXAS MODEL AERO CLUB  
517 Navarro Street, San Antonio, Texas

### SPRINGFIELD MODEL AERO CLUB

Springfield, Mass.

MILWAUKEE MODEL AERO CLUB  
455 Murray Ave., Milwaukee, Wis.

CONCORD MODEL AERO CLUB  
c/o Edward P. Warner, Concord, Mass.

PLATTSBURG MODEL AERO CLUB  
c/o James Regan, Jr., Plattsburg  
Barracks, Plattsburg, N. Y.

MODEL AERO CLUB OF OXFORD  
Oxford, Pa.

## How to Construct and Fly Model Aeroplanes

By G. A. CAVANAGH

### Frame

The preceding articles dealt entirely with the construction of the propellers and wings, because these having been completed can be quickly assembled when the frame has been made. The frame of the model is next to be made, and it must be made carefully, for to the frame all other parts of the model are attached, and in addition it must stand the strain of the rubber bands when they are tightly wound up.

There are many different types of frames in use but the standard type is that type of frame which resembles a V in shape when finished. This type of frame may be made strong yet very light, all depends on how it is constructed. Sometimes a single stick is used, but only by those of experience; the majority of model flyers prefer the double stick frame.

The two main sticks of the frame are made from spruce 36 inches in length, 3-8 x 1-4 inches in dimensions. To make them streamline, round off the edges of the sticks and then smooth them down with sandpaper. On one side of the sticks at one end shave off a little of the wood, say about 1 inch, so that the sticks may be fastened to a point. It must be remembered that the length of the sticks remains the same. Before fastening take a piece of wire 4 inches long and bend it around the point so that it fits snugly, then bind thread around the point leaving about  $\frac{1}{2}$  inch of wire on each side of the point of the frame to be looped so as to receive the books which are attached to the rubber strands. A little glue may be added to hold the thread in place. When this has been done the sticks thus formed give the appearance of a large V. To hold the sticks apart at the other end, and for a bearing spar, cut a piece of bamboo 10 inches long,  $\frac{1}{8}$  inch thick by  $\frac{1}{2}$  inch in width and fasten to the extreme rear ends of the frame members or "sticks" at a distance of about 1 $\frac{1}{2}$  inches from either end of the bamboo strip. In order that the bamboo may come flush with the top of the sticks, measure off  $\frac{1}{2}$  inch from the rear ends of the sticks and cut down about  $\frac{3}{16}$  of an inch in which is fitted the bearing brace. Now bind thread around these joints to make them secure. To brace the frame between both ends cut two pieces of bamboo, one 9 inches long and another 2 $\frac{1}{4}$  inches long, fasten the longer piece on the top of the frame 9 inches from the rear and the shorter piece 10 $\frac{1}{2}$  inches from the front. Now cut two pieces of  $\frac{3}{32}$  inch, bronze tubing,  $\frac{3}{4}$  of an inch long, making sure that both ends are free from burrs. With thread and glue secure these to the under side of the bearing spar about  $\frac{1}{4}$  inch from the ends and in such a way that they will come exactly in the center of the frame members or "sticks." Further see that they run parallel with the frame members, for if they do not the result will be an uneven revolution of the rubber strands when unwinding and consequently a loss of power.

Many model builders after completing frame, render it damp-proof by applying to it a good coat of shellac. To prevent the point of the frame from spear-

ing into anything, most model flyers make a big loop from a piece of reed 6 inches long. This they fasten to the point of the model, one end of the reed on the top and the other on the under side. When securely bound around with thread it makes a very good bumper.

All that is necessary to complete the model is to assemble the parts and string the rubber strands. However, to properly assemble the parts is as important as the making, and, therefore, requires a clear explanation. The assembling of the model will be described in the next article, which will appear in the issue of January 17th.

### Aero Science Club of America

The members had the pleasure of hearing Mr. W. J. Beach from Australia speak on the subject of compressed air motors at the last meeting. Mr. Beach gave a very interesting talk concerning his experiences with the compressed air motor. He also spoke on other types of engines with which he had had experience. The best part of the evening was devoted to hearing Mr. Beach speak. The members greatly appreciated Mr. Beach's talk and were glad to learn that he would bring with him to the next meeting some samples of his work.

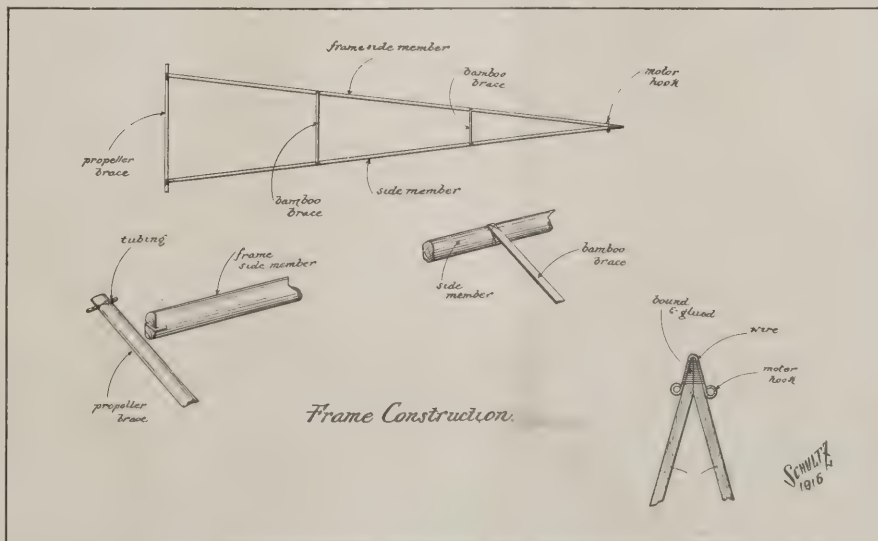
Mr. Durant, director, is devoting some of his spare moments trying to obtain the use of an Armory for indoor flying. He hopes to be able to secure the use of one in the very near future.

During the coming week Mr. Cavanagh will represent the club at the Y. M. C. A. of Orange, N. J., where it is hoped to establish a model club. For further particulars address the Secretary, 29 West Thirty-ninth street, New York City.

### The Orange Y. M. C. A. Model Committee

In view of the interest which is being shown by the members of the Elmwood School M. A. C., it is believed that Model clubs will be formed in various other schools of the Oranges in the very near future. Mr. R. M. Jacobus, chairman of the committee, who is in charge of this work, is now endeavoring to arrange for the formation of other clubs.

Models were received from the Aero Science Club for exhibition purposes and they will be distributed among the various schools. One or two will be kept at the Y. M. C. A.







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### From the Vivisection Gazette

MUCH interesting material has been gained recently by the Callous School of Agony through dropping dogs out of aeroplanes. A long series of experiments were conducted, the dogs being dropped from various heights and carefully observed as to their actions both before and after reaching the ground. When the data are carefully compiled and digested, it is hoped to discover a wonderful prophylactic serum to be used on aviators, which will render them absolutely immune under such circumstances. If this result is accomplished it will be a great forward step in the science of aviation. The experiments were said to have been keenly enjoyed by all the physiology students in this justly famous School of Agony.—*Life*.

"Them roads is vile with them automobiles," *Life* makes a Tennessee mountaineer say as he sat in front of his lonely cabin while the horseman drew rein on the deeply rutted road. "Why, do many come up here?" asked the surprised visitor. "Many? Why, stranger, I don't believe there air a week but what one goes by!"

What will happen when the aeroplane comes into its own?

Another Zeppelin broken in two! Well, the clever old Count has only to develop his machines to the point where each part will grow into a new and perfect whole, as the amoeba and other cell forms do.



Mr. Vernon Castle is making rapid progress with his course in aviation at the Curtiss School at Newport News. This is how *The Pittsburgh News* looks upon the event.

#### A False Alarm

The dangers of touring by air at this time have played havoc with the nerves of timid passengers.

Early one morning recently there was considerable commotion on the decks of an aerial dreadnought plying between Savannah and Baltimore, when a scantily clad man hurried from his stateroom and dashed toward the upper deck. On the way he ran into the captain of the vessel.

"What's the matter, captain?" he managed to gasp. "Have we been torpedoed?"

"Calm yourself, my dear sir, and be prepared for the worst," answered the official.

"Oh, don't tell me we're going down!" moaned the other. "Quick, where are the life-preservers?"

"They wouldn't be of any service at this stage," explained the captain.

"Too late?" quavered the despairing passenger.

"Yes," said the captain, very solemnly. "We've done all we can for you. You'll have to look out for yourself from now on. You see, we've just tied up to the dock."—*New York Times*.

More women and children killed in Zeppelin raids on London. There is one question the Germans seem never to ask themselves, "Does it pay?" Having decided to make as big a mess as possible, they go banging ahead, like a bull in a crockery emporium.

#### 'Twas Fixed

A stranded but still haughty aviator was obliged to put up at a dilapidated country hotel. She glanced frowningly about the office, reluctantly signed the register, and took the brass key from the proprietress.

"Is there water in my room?" she demanded.

"Why, there was," replied the proprietress, "but I had the roof fixed."—*The Craftsman*.

T(w)o motors or not t(w)o motors is the question with most constructors.

In addition to cheap submarines, Henry Ford is now reported to be planning to "build small balloons capable of carrying two persons," to sell at \$850. Is the Detroit automobile-maker eventually to provide jitney transit not only for the surface of the earth but in the heavens above and the waters under the earth?—*N. Y. World*.

Now that the distinguished dancer has joined the British aerial navy we suppose that the latest caper in aviation circles will be known as the Castle glide.

#### A Definition

Originality: originality in aeroplane is an expensive luxury.



G. DOUGLAS WARDROP

Managing Editor

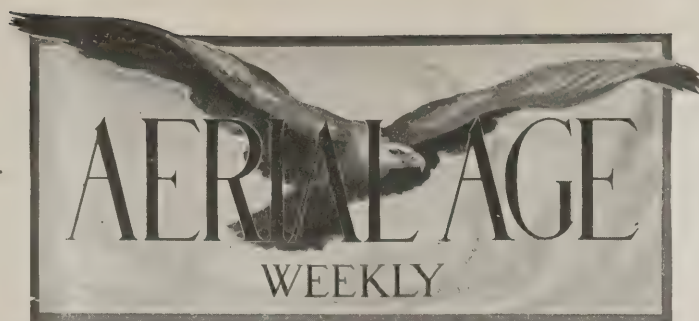
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No. 18

## Tenth Aero Club Banquet Brings Out Important Developments in Aviation

DIPLOMATS, scientists, leaders in the Pan-American and national defense movements, aeronautical authorities and sportsmen—about five hundred people in all—were present at the Tenth Annual Banquet of the Aero Club of America, held at the Biltmore, on Wednesday evening, January 12, 1916.

After the dinner Mr. Alan R. Hawley, president of the club, proposed a standing toast to "Our Country and the President of the United States," and a toast to "Our Honored Guests From South and Central America." And after the toasts Mr. Hawley, on behalf of the club, extended a hearty welcome to the guests.

"I see, with pleasure, present to-night," said Mr. Hawley, "some of the earlier pioneers who attended ten years ago the first meetings of the Aero Club of America. At that time aeronautics consisted entirely of lighter than air craft and flights by heavier-than-air machines were thought possible by very few people, who were looked upon by the rest of the world as dreamers.

"As an instance, showing how a few years before this even the Patent Office did not believe heavier-than-air flight possible, I will read you a letter from the Patent Office to an inventor who applied for a patent on a heavier-than-air machine:

June 11, 1892.

SUBJECT: MACHINE FOR MECHANICAL FLIGHT.

Frank Barnett,  
care of Knight Bros., City.

On taking up this case for examination, it is found that the invention disclosed is as a whole incapable of practical operation, since without the assistance of a gas field or equivalent the device will be incapable of ascension. In other words the invention is not useful within the meaning of the law.

No evidence will be considered sufficient to demonstrate the operation of the device and warrant the withdrawal of the objection made by the office, except a working model; that is, one capable of ascension and propulsion.

W. E. SIMONDS,  
Commissioner of Patents.

"In the light of this will anyone dare to doubt the possibilities of flying across the Atlantic, carrying mail and 'express merchandise' by aeroplane, establishing aerial lines in South and Central America and other such projects, which are now under consideration?

"Whereas, ten years ago few people admitted that dynamic flight was possible, today they will listen eagerly to plans of aeroplanes that are now being constructed, which can lift ten tons, of which nearly two tons is useful load. This gigantic machine which is being constructed by our guest, Mr. Curtiss, will have one thousand horsepower, delivered by several engines, thereby insuring continual flight even if one of the motors should stop.

"Only two or three years ago we considered the problem of equipping aeroplanes with two motors as a difficult one. So difficult that Mr. Edwin Gould, who is with us tonight, being anxious to have this problem solved, offered a cash prize of \$15,000 to bring about the application of two motors in one aeroplane. This prize was not won.

"Today, aeroplanes with two motors are the rule, and not the exception—and we are reliably informed that there are aeroplanes with as many as six motors, in use in Europe.

"This is but one of the instances in aeronautics where the impossibilities of yesterday are the commonplace of today.

"I tell you now that you may wake up some morning this summer and learn that the first flight across the Atlantic has been made. Once the Atlantic has been crossed, it will be done again and again, and I dare say that ten years from now we will have as many aeroplanes flying across the Atlantic as there are now in the world—and that is approximately fifteen thousand."

President Hawley read, from among two hundred messages, letters and telegrams from President Wilson, Secretary Daniels, Governors Charles S. Whitman, of New York; George W. P. Hunt, of Arizona; James Withycombe, of Oregon; Edward F. Dunne, of Illinois; the adjutant generals of different states, and other representative people, as follows:

From the President, Woodrow Wilson:

"I have received your kind letter of December 4, and have had pleasure in laying it before the President. While he deeply appreciates the cordial invitation which you extend to him, he fears it will not be possible for him to visit New York at the time you mention. He asks me to thank you warmly for your courtesy in this matter."

Sincerely yours,

(Signed) J. P. TUMULTY,  
Secretary to the President.

From Senor Cespedes, The Cuban Minister:

"I have always been a convinced partisan of aeronautics as necessary to Pan-Americanism as the wireless, the cable, transportation, friendship and mutual confidence. The Aero Club of America has come forward with a great plan, and Pan-America is in duty bound to advance with enthusiasm along such lines leading to its greater welfare and power. I regret not being able to attend the banquet, but hope to be able to assist you in your splendid project."

From Orville Wright, of Dayton, Ohio:

"My brother asks me to thank you for your invitation to attend the Aero Club of America banquet, and to say for him that he is sorry not to be able to do so. He has been in bed for four weeks, and we do not know when he will be able to be up and around. The trouble is due to the Fort Myers injury, and to nervous exhaustion. My brother joins in best wishes for a successful dinner. We are both sorry not to be able to come."

Sincerely,

(Signed) KATHERINE WRIGHT.

From the Honorable Josephus Daniels, Secretary of the Navy:

"I regret exceedingly that I will be unable to accept the very kind invitation of the Aero Club of America to the Tenth Annual Banquet. Please convey to the Aero Club and their guests my best wishes for a most enjoyable and interesting evening.

"The subject of preparedness in our Navy for the defense of this country is the one that is uppermost in my mind. The preparation of an aeronautic service as a part of our fleet is an important question that is being given every consideration. The difficulties that have been encountered are in a great measure those that would be expected in a new service like aeronautics. In spite of these, it is believed that decided progress has been made in the development of aircraft for naval use.

"All problems relating to the development of an aeroplane for use at sea have been attacked by our aviators at Pensacola, and by our designers and experts in the Navy Department. Also special observers have been stationed abroad since this war began; one officer in Berlin, one in France and one in England, that are constantly watching developments to give us the latest information regarding the use of aeroplanes as well as dirigibles in actual warfare. These officers are some of our ablest aviators.

"There is one question that is now bothering us, and has been from the very beginning, and that is a suitable, reliable motor of sufficient power for naval use. Many motors have been produced in this country but on tests have not come up to the requirements. This has undoubtedly been greatly due to the inexperience of our manufacturers in the development of this kind of machinery, which is again of a special kind. The best automobile motors are not equal to the work required of an aeronautic motor, so that even our manufacturers of the high-grade automobile motors must give special attention to the development of an aeronautic motor. This is now being done, and it is hoped and believed that

**America Must be Given a Navy Equal to the Best. If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.**



in the very near future our manufacturers will produce a motor as good as any in the world.

"One of the most important questions that was laid before the Naval Consulting Board, which I have organized, was the question of the development of an aeronautic motor. That Board, of which Mr. Thomas A. Edison is chairman, has appointed a sub-committee to give particular attention to this question.

"The manufacturers of aeroplanes and aeroplane motors in this country have not been lacking in the desire to assist me in developing aeroplanes and motors for the Navy. In fact, they have been anxious and willing to assist in every way possible. In order to reciprocate I have directed that contracts be placed for aeroplanes which have been developed in design only even before the actual machines have been built.

"The Navy has a splendidly equipped aeronautic station at Pensacola. The old Navy Yard with its shops and storehouses is well suited to the work required. The location of this station on a large bay, with a climate suited to flying, but yet sufficiently variable to give all kinds of experience in flying, is excellent. By the first of February there should be 36 aeroplanes at the station for the instruction of officers and men and for all kinds of experimental flying. The aeronautical ship 'North Carolina', should, by that time, be fitted out with the launching device that has been developed, and equipped with five aeroplanes. With this equipment a series of exercises in the open sea will be undertaken. These will include scouting under all kinds of weather conditions, landing and getaways in the rough open sea, and spotting for fire control of gun fire at target practices.

"The dirigible which I directed to be constructed in this country was intended as a training ship for the education of officers and men of the Navy in the handling of this type of aircraft. There were practically no manufacturers of this country who were capable of constructing dirigibles. The placing of an order for a dirigible in this country was intended to develop that industry so we would not have to depend upon foreign countries for dirigibles. There has been some delay in the delivery, but in the early spring this dirigible should be in operation at the Aeronautic Station, Pensacola. A spherical balloon is already there, and it is to be used in the preliminary training of officers and men for handling dirigibles. The hydrogen plant for dirigible and balloon work is rapidly reaching completion, and will be ready by the time we are ready for balloon operations.

"The plans of a kite balloon, which it is believed, will be necessary for naval use, have been under consideration for some time. It has been hard to find designers and constructors who are familiar with this type of aircraft, but it is now hoped that by spring one of these aircraft will be on hand for use.

"I feel that the large amount of preliminary work required for the development of an air fleet for our Navy has been accomplished, and in the near future we will add to our fleet aircraft that will be equal to or better than those of any other country. Having gained this advantage we will maintain it, and increase our air fleet until it is fully adequate to all our requirements."

Very truly yours,

(Signed) JOSEPHUS DANIELS.

From Thomas A. Edison:

"Regret to say that it will be impossible for me to attend the tenth annual banquet of the Aero Club of America. I am just in the midst of some extremely important investigations which demand my entire time, and keep me busy from eighteen to twenty hours a day.

"I am sorry I shall have to forego the pleasure of meeting with you all."

From Hon. Charles S. Whitman, Governor of New York:

"The military use of the aeroplane has been amply demonstrated by the events of the last year. Through the efforts of your organization machines have been made available for our State forces and officers and men are making good use of the opportunity afforded. The patriotic co-operation of your club in increasing the efficiency of the military and naval forces of the State is much appreciated."

From the Honorable George W. P. Hunt, Governor of Arizona:

"With reference to the commendable work being furthered by the Aero Club of America I readily go on record as believing that the most effective way of preparing the United States for national defense is to utilize, so far as possible, in peaceful pursuits, such agencies and equipment as might, on short notice, be converted, if necessary, into means of protecting this country against invasion by a foreign foe. In such preparation the aeroplane would, of course, play a highly important part, and consequently it follows that your organization's plans for the greater utilization of the aeroplane in times of peace is a noteworthy stride in the right direction. Although Arizona's National Guard, I regret to say, has no aviation corps, it is reasonable to anticipate that the youngest State in the Union may, eventually, emulate in this respect the precedent set by the most populous one."

From the Honorable James Withycombe, Governor of Oregon:

"I certainly wish you all success in your meeting, and in the many admirable enterprises conducted under the auspices of the Aero Club of America. The importance of aerial developments from a military standpoint, and especially that of National defense, is becoming more and more evident, and encouragement to those who are pioneering in the good work is certainly fitting."

From the Honorable Edward F. Dunne, Governor of Illinois:

"I am very glad to note the widespread interest in the establishment of aeroplanes as an arm of the regular Army and the National Guard, and wish the movement every possible success."

From the Honorable Earl Brewer, Governor of Mississippi:

"I want to say that I firmly believe that our National Government should extend, to a great degree, our aviation service. The present war has shown that a well-manned aviation corps is of vital importance—in fact, a necessity. Aeroplanes have taken the place of cavalry as scouts, and they are the only means by which the movements of an enemy can be observed and precautions taken to meet attacks and frustrate them. Aside from its use in war I believe that in the near future aviation will have reached that degree of perfection that mails will be successfully carried, especially in the rural districts. The Aero Club of America has done and is doing a great work in educating the people to the importance and necessity of proper aeroplane service, and I congratulate it upon the work thus far done and that contemplated for the future."

From the Adjutant-General Thomas T. Stewart, of Pennsylvania:

"The Aero Club of America is doing a splendid and magnificent work and I certainly wish them the greatest success. I have not been able, up to this time, to do much for aviation in the State of Pennsylvania, but I hope that in the near future I shall be able to influence some of our influential and forceful people."

From the Adjutant-General J. C. R. Foster, of Florida:

"I am much interested in the important work which the Aero Club of America has undertaken and am anxious to co-operate as fully as possible. No steps have been taken as yet looking to the formation of an aviation corps for the National Guard of Florida, but some interest has been expressed among the members of the Naval Militia at the station of Key West, and authority has been asked to form an aero station at that point. This is now under consideration, and after conference with the Federal authorities it is proposed to grant this authority if it is found that there is reasonable ground for belief that such organization can be equipped and its members given the necessary training so that it can be made a useful unit."

From the Adjutant-General L. W. Statesbury, of New York State:

"I was particularly desirous of being with you in order that I might have opportunity to express to you, and to the members of the Aero Club of America, my appreciation of all your generous assistance to, and co-operation with, the State, in the development of military aeronautics.

"For all that your patriotic organization has done and is doing to concentrate the public interest on an adequate defensive policy, all public-spirited citizens should be genuinely grateful to you. I certainly am, and wish you a most successful and interesting occasion."

From the Adjutant-General P. L. Hall, Jr., of Nebraska:

"In connection with aeronautics I might say that the National Guard of Nebraska has made considerable advancement in this branch of the service. We have at our disposal Capt. Ralph E. McMillen, who was recommended to us by your club. Through him we have been able to work out bomb-dropping, aerial reconnaissance, in defensive and offensive combat, and aerial photography. We have now organized an aviation corps of about fifty members.

"Captain McMillen recently made a trial flight from Lincoln, Neb., to Omaha, Neb., a distance of sixty-five miles, in forty-five minutes. Much interest was manifested by the citizens of this State, as it was the first cross-country flight ever attempted in this, outside of the flights made by our corps during the camps of instruction last summer. Excellent results were obtained in this branch of the service in connection with the infantry and signal corps."

From the Adjutant-General Henry Hutchins, of Texas:

"I wish you the utmost success in your plans and shall be glad to co-operate to the fullest extent possible."

### Award of Collier Trophy

President Hawley read a letter from W. Redmond Cross, chairman of the Collier Trophy Committee, announcing the award of the Collier Trophy, which is awarded each year "for the greatest achievement in aviation in America, the value of which has been thoroughly demonstrated by use during the preceding year," as follows:

Alan R. Hawley, President, Aero Club of America, No. 297 Madison Avenue, New York City:

Dear Sir—At a meeting of the Collier Trophy Committee, held today, it was unanimously decided that the trophy for the year 1915 should be awarded to Mr. W. Starling Burgess, of Marblehead, Mass., in recognition of his development and demonstration of the Burgess-Dunne hydroaeroplane during the year 1915.

Yours very truly,

(Signed) W. REDMOND CROSS,  
Chairman, Collier Trophy Committee.

### Award of Curtiss Marine Flying Trophy

President Hawley announced the winner of the Curtiss Marine Flying Trophy. This wonderful trophy, which was exhibited in the Banquet Room, was offered last year by Glenn H. Curtiss, for competition between the members of the twenty-seven aero clubs of the United States. The conditions for 1915 were:

"The winner of the trophy the first year, 1915, shall be the person, member of the Aero Club of America, or any of the affiliated Aero Clubs, who, at the expiration of the time set for the close of the first period of the contest, October 31, 1915, shall hold the record for distance covered between ten hours of one day, which shall have been established in accordance with the rules given hereinafter. He shall receive the cash prize of \$1,000 or equivalent, and the club of which he is a member shall become the record holder of the trophy, which is to be held in custody by the Aero Club of America. A club becomes the owner of the trophy after the fifth year if it has been won for three consecutive years by its members."

There were twelve entries for this trophy, and in the spirited competition which took place on the Atlantic and Pacific oceans and the Great Lakes, some very remarkable flights were made, including half a dozen flights of between four hundred and five hundred miles.

The winner of this trophy for 1915 appears to be the Aero Club of California, represented by Oscar A. Brindley, who made a flight of over five hundred and ten miles—which distance is being confirmed by official measurement.

### National Balloon Race, 1915

The national balloon race for 1915 was held from Wichita, Kan., on October 7. Mr. William Assman was the winner of this event, covering a distance of 363 miles in balloon "Aero Club of St. Louis."

### 113 Certificates Granted During Year

The number of certificates granted during the past year total 113. These comprise four classes of tests: Spherical balloon, aviation, expert and hydroaeroplane.

### 24 Aviation Medals of Merit Awarded

President Hawley awards twenty-four Aero Club of America "aviation medals of merit." The list of those to whom the medals are awarded is appended herewith.



# THE NEWS OF THE WEEK

## Twelve Great Seaplanes for the U. S. Navy

Within two months there will be delivered at the government Aeronautic Station at Pensacola, Fla., twelve large seaplanes that are being finished at two plants in Massachusetts. Six will go from the plant of the Burgess Company, at Marblehead, Mass., and six from the plant of the Sturtevant Aeroplane Company at Jamaica Plains.

Three of the machines contracted for from the Burgess Company will be battle seaplanes, the largest and fastest craft that the government will have.

These three planes now being tested daily, when weather permits, will travel 80 miles an hour, will carry two men with seven hours' fuel supply, an offensive equipment of one machine gun and 150 pounds of ammunition. The gross weight of the machine is 3300 pounds, nearly a ton and a half, and it will carry a load of 1,200 pounds.

The other machines being constructed by the Burgess Company are Burgess tractor planes, equipped with 100-horsepower motors. They do not carry as much as the heavier type but they are better climbers and are recognized as the standard type of the Navy Department.

These planes will be delivered in six weeks at the rate of one a week.

The Burgess Company has just concluded an order of forty-eight planes for the British Admiralty and these are now in England and ready to be sent to the front. These machines were turned out at the rate of three a week, which has given the company the opportunity to expand its plant for any possible American business.

One of the interesting features of the Sturtevant order is that not only the bodies, but the aileron surfaces controlling the lateral movements of the craft will be of steel construction, as recently described in *Aerial Age*.

The power plant will be the Sturtevant motor. The type used will be the 140-horsepower, eight-cylinder, running at about 2000 revolutions, but geared down within the motor casing to revolve the propeller at 1350 revolutions. A further new development promised in the plans will be all-steel pontoons, which the designers believe will not only prove stronger, but lighter than the customary type of wood. The latter, after long service, become water-soaked, thus increasing by many pounds the original weight of the aeroplane.

## Americans Who Enlist Do Not Forfeit Citizenship

The United States Bureau of Immigration has ruled that Americans who enlist under a qualified oath of allegiance in the fighting forces of foreign powers shall not be regarded in their applications for readmission to the United States as having lost citizenship. Therefore all aviators taking service abroad have the same status at the Bureau of Immigration as if their citizenship here had never been interrupted and after entering they automatically resume the rights of citizenship.

## National Society for the Advancement of Patriotic Education

At a meeting held at the Aero Club of America, 297 Madison avenue, the National Society for the Advancement of Patriotic Education was formed for the purpose of so educating the American people in the fundamentals of patriotism that a new and more vigorous national spirit shall be aroused.

Henry A. Wise Wood, who has been doing masterful work in behalf of national defense, was chosen president of the new organization; Henry B. Joy, the well-known automobile manufacturer, vice-president; C. Harrison Gray, executive secretary; Raymond B. Price, treasurer. The board of governors is composed of Perry Belmont, of Washington; Martin T. Gillin, of Racine, Wis.; Henry B. Joy, of Detroit; Albert Bond Lambert, of St. Louis, and Raymond B. Price and Henry Woodhouse, of New York City.

The mission of the society is announced in the following official statement:

"In the belief that the state of justice and peace among nations can be maintained only when a preponderance of military power has been gathered into the hands of the pacific peoples, and that until such a transfer of the balance of military power has been effected the safety of no nation is assured, the National Society for the Advancement of Patriotic Education has been formed for the purpose of promoting the translation of the patriotic impulses of our people into an effective national spirit, in order that a united and strengthened America shall emerge, which by its preponderant power acting upon the side of peace shall discourage aggression and insure the stability of the world.

"The work of the society will consist of the preparation and distribution, through the press or by pamphlets of appropriate literature, in supplying competent speakers and by the establishment of a bureau which will furnish directly, or through any organization which may apply for it, information upon cognate subjects, and especial attention will be paid to schools and colleges. As the object of the society is purely philanthropic, no charge will be made for its literature or services."

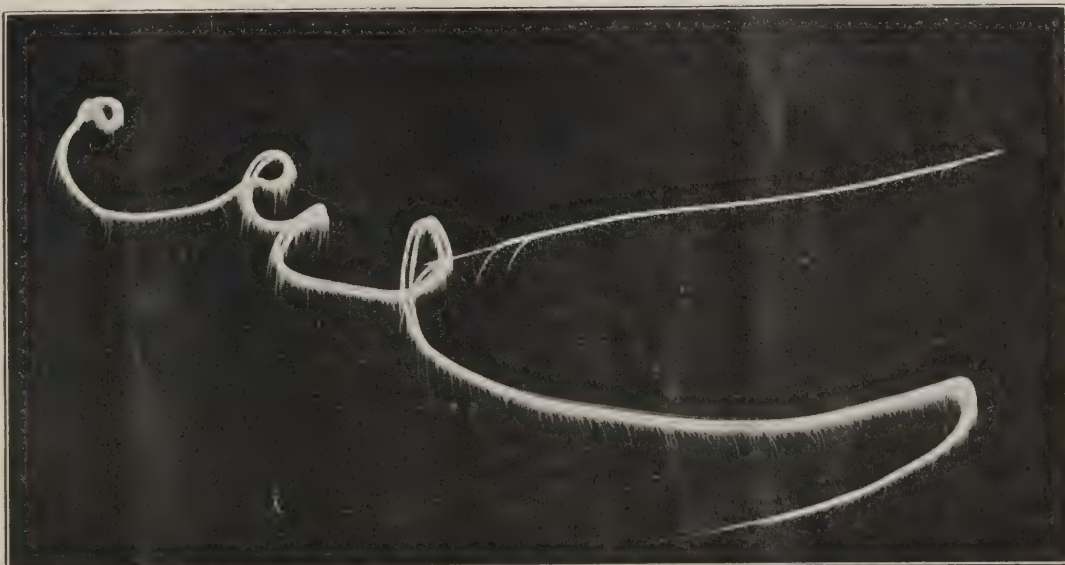
## Bonus to Employees of the Burgess Company

Employees of the Burgess Company, aeroplane makers at Marblehead, Mass., are working with renewed interest as the result of the distribution of a cash bonus recently made to all who had been in the service of the company more than a year. The bonus was distributed according to the length of service and it is needless to say that the men are pleased over this recognition of their fidelity and their abilities.

## An Aerial Torpedo Reported by Marconi

Signor Guglielmo Marconi, who returned to Rome in December after an absence of five months in England and at the front in France, reports that a captain of engineers has invented a torpedo to operate in the air against Zeppelins.

Miss Katherine L. Stinson looping at night at Los Angeles, where she succeeded in writing the abbreviation "Cal." in honor of this her first attempt to eclipse the feats of her male competitors.





### Miss Katherine Stinson's Looping at Night

Not satisfied with all the aeronautic honors which she has gained in her short life of nineteen years, Miss Katherine Stinson, coveted the one remaining flight which she held to be necessary to place herself at the very top of the experts in flying. She had performed all the "stunts" known in the art by day, but after Art. Smith had looped-the-loop by night, leaving behind him a trail of fire, she resolved that what an aviator had done an aviatrix can do also.

The feat was performed in Los Angeles. Using the sky for a background, she etched fantastic figures with her biplane studded with magnesium pyrotechnics. She traced the letters, "Cal," in the sky; she looped; flew upside down, and dropped in a mad tumble to within a hundred feet of the earth all the while being showered with the drippings from the burning lights on her biplane.

Miss Smith flew from a field, narrow, rough and lighted only with four small bonfires of wood. Probably less than twenty-five persons witnessed the starting and the landing because the little lady thinks that it is not lucky to try a new stunt before a great crowd, but from afar thousands saw the aerial display weird and beautiful, like a great invisible pen writing in molten fire on the curtain of the night.

"When I looped-the-loop in Chicago last July," said Miss Stinson, "it was a bitter pill for the male loopers to swallow. But I accomplished all their stunts and in many cases went them one better. Only night looping stood between me and the top. I chose Los Angeles, the wisest aviation city in the world, to be the scene of my triumph.

"Now that I have equaled the greatest efforts of the male flyers I am going to go ahead and evolve a new stunt or two that will put woman ahead of man at the most difficult of all sciences."

After this unheralded exhibition Miss Stinson left for her home in San Antonio, Texas, and next month she expects to return to California. In her four years in aviation Miss Stinson has made more than 1,000 flights, has looped the loop 515 times and has developed a skill in handling an aeroplane that is marvelous even to other aviators.

Miss Stinson recently paid a visit to the officers of AERIAL AGE. She had been called to Ottawa on business, and took occasion to extend her trip to New York, Boston and Buffalo. She visited the Curtiss plant in the latter city, the Sturtevant aeroplane factory at Jamaica Plains, Mass., and the Sturtevant motor plant at Hyde Park, Mass.

### Pittsburg Will Have an Aero Squadron

Announcement has been made in Pittsburg that the State of Pennsylvania plans to form an aero squadron of Pittsburg militiamen and that a squadron of eight aeroplanes will be stationed in that city when the complete plans have been carried out.

A military radio company, the first in the National Guard of that state is also to be established there.

### Records Homologated

Lieut. R. S. Saufley, U. S. N., has distinguished himself by breaking the American hydroaeroplane altitude record, pilot alone, twice in succession. The figures as homologated by the Aero Club of America are as follows:

Flight No. 1, Nov. 30, 1915, Pensacola, Fla., 11,056 feet.

Flight No. 2, Dec. 3, 1915, Pensacola, Fla., 11,975 feet.

These altitudes were attained in a Curtiss hydroaeroplane type of machine equipped with Paragon propeller, three-bladed. The Aeronautic Station Number of the machine used in the first flight is "AH-15," and that used in flight No. 2, "AH-14."

### Aviator A. C. Beech in Jacksonville

In a signed article in The Metropolis of Jacksonville, Fla., A. C. Beech, who has been looping-the-loop over that city, defends his daring as follows:

"To the average man or woman, an aviator is a sort of 'crazy person who risks his life for the money that is in it.' As a matter of fact the proficiency necessary to perform the higher class aerial feats can only be acquired by long and careful practice coupled with a thorough knowledge of the technical branch of aeronautics. In the first place, the aviator must be absolutely convinced of his own knowledge that all parts of his machine be of such strength as to withstand by a safe margin the tremendous stresses which the spectacular flying subjects it to. In the second place, the aviator must have had sufficient practice to render the actual control of the aeroplane instinctive and independent of deliberate thought effort, because the successive movements are too rapid to make planning them possible. But given an aeroplane with the same safety margin as the axle of a railroad passenger coach, given an aeroplane of modern construction and design which will fall from any position into a controllable position, and the aviator can with reasonable safety fling his machine into situations limited only by its momentum, the power of the motor and the pull of gravity.

In the flight of yesterday I deliberately permitted the aeroplane to get into positions which were considered positively fatal, but a few months ago."

### Satan Day to Fly at University of Illinois

Satan Day, the youngest licensed aviator in America, is now attending the University of Illinois, where he is a Junior. Young Day will start his fourth exhibition season this Spring and will probably fly at Champaign.

There has been some talk of him flying in connection with the annual Spring military manoeuvres of the cadet regiment. The University of Illinois has a huge new armory and the largest student regiment in the United States, and Day thinks that his alma mater should be equally progressive in Military Aviation.

During the past season Day was managed by R. S. Richardson, who managed Cal Rodgers at the Chicago meet in 1911, and on his transcontinental flight from New York to Los Angeles. This year he will be under another manager as his services are jointly contracted for by the Benoist Aeroplane Company and some business men of his town.



Some of the students at the new Wright School at Augusta, Georgia. The weather conditions have been excellent since the opening of the school and the students have made rapid progress.



**Pacific Coast News**

T. T. Maroney, the Puget Sound aviator, was a visitor to the Christofferson plant last week.

The Christofferson school has now been located in its new quarters near Oakland. Hangars are being built to accommodate a large number of aeroplanes, and exhibitions will be given weekly and on holidays.

Art Smith is building ten Baby Smith Racers. These little automobiles are to be used in conjunction with his aeroplane exhibitions next season.

A message from Charlie Niles from Osaka, states he is having a very successful exhibition tour of Japan.

On December 19, "Penty" Smith, from New Zealand; Roy Ternstra and Harold Smith passed the tests for air pilots, at the Christofferson school. Mr. Guy T. Slaughter conducted the examinations.

Several weeks ago Roy Walker obtained a certificate, and is now serving in the English Flying Corps. Another Christofferson pupil, Duncan Smith, is an officer in the Royal Naval Air Service, stationed at Eastbourne, England. Jong Jay and George Gutler will soon be ready to take their tests also.

**Flew with the Baby To Keep Dinner Appointment**

Mrs. Harry Christofferson, of San Francisco, who, with her husband, is temporarily stopping at Long Beach, Cal., recently took her sixteen-months-old baby on an aerial voyage in order that she might reach home in time to keep a dinner engagement. She was some distance from home when she suddenly realized that she had but a few minutes to return to her domicile before the arrival of friends whom she had invited to dine with her. So she went to the beach where her husband was just getting ready to make a flight.

Mrs. Christofferson climbed aboard the biplane with her baby, and after Miss Du Ree, one of her guests, had taken her seat, the aviator shot up into the air and an instant or two later he had discharged his passengers within half a block of the Christofferson residence. Even the baby enjoyed the trip, Mrs. Christofferson declared.

When the guests arrived they found their hostess waiting for them.

**Searched the Sea with an Aeroplane**

Harry Christofferson not long ago volunteered his services in searching for two men who had put out to sea from Los Angeles, Cal., in a small canoe. He cruised up and down the coast and far out to sea in the hope of getting trace of them from above. He was not successful, however, and as their empty canoe was found later it is supposed that they were drowned.

**Western Canada News**

The British Columbia Aero Club, of Vancouver, B. C., is composed of a number of energetic young men, actively interested in aviation. The one aim of its members is to aid in the defense of their country at the front. Among its directors is a member of Parliament, Mr. H. H. Stevens. The club at present has one Curtiss hydro-aeroplane of the pusher type, although several others are in the course of construction.

The Hamilton Aero Manufacturing Co., Limited, recently organized, is engaged in turning out several machines of the two-motor tractor type. The factory is working to full capacity and announces that prospects are unusually bright.

Colonel Burke, official observer in Canada for the British Government, stopped in Vancouver on Dec. 4, to inspect building facilities and was the guest of the British Columbia Aero Club, while in the city.

**Aero Club at Boulder, Colorado**

An aero club composed of young men has been formed at Boulder, Colorado, with Clinton Dumm as president. The specific object of the organization is to construct a large passenger-carrying aeroplane, and preliminary work will be started immediately. The club will also promote interests in aeronautics among the young men of the city. Meetings for study will be held at the Y. M. C. A. on the second and fourth Fridays of each month.

**Miss Ruth Law, Aviatrice**

Miss Ruth Bancroft Law is giving daily exhibition flights along the beach at Daytona, Florida. Recently, at a height of 4,000 feet, she outdid all previous performances. She initiated the evolutions with six complete loops and concluded with a double reverse loop which furnished the spectators so many thrills that the timid were glad when they saw her alight in safety. Miss Law's great skill has given her fame and popularity in the Daytona section of Florida.

**The National Aeroplane Fund**

Recent contributions to the National Aeroplane Fund include the following subscriptions: E. M. Herr, \$250; L. A. Osborne, \$250; Alexander Forbes, \$200; "A New York Woman," \$100; Henry S. Kip, \$50; Mrs. and Mr. Geoffrey Whitney, \$50; Jules Vail, \$50; G. R. Agassiz, \$50; D. B. Fay, \$50; Wm. Emerson, \$50; Miss Dorothy Salisbury, \$10; Dr. and Mrs. D. W. Jean, \$10; Mrs. William Emerson, Jr., \$10; George Crompton, \$10; Joseph D. Holmes, \$5; Alfred N. Martin, \$3.

The metal fillings room at the Niagara Street plant of the Curtiss Co. in Buffalo.





## U. S. NAVAL EXPERIMENTAL WIND TUNNEL

THE large Experimental Wind Tunnel which the Navy Department has established in the Washington Navy Yard at the Experimental Model Basin, where warship models are tested, has now been in operation about a year. The tunnel is the largest in the world, having a section eight feet square at the point where the models are placed for testing. In addition to the advantage gained by the size, it is possible with the 500-horsepower, motor-driven fan, to get wind speeds up to 75 miles an hour, which permits experiments being made at real flying speeds.

The tunnel consists of a closed circuit shaped like the link of a chain, as shown in Figure 1. The 500-horsepower top horizontal discharge fan of the corrugated paddle type, with an inlet diameter of 11 feet, 2 inches, and a discharge duct 7 feet, 6 inches by 9 feet, 2 inches, is placed at one end of the link. At the other end, where the air straightens out before flowing through the experimental chamber, are the baffles, which are necessary to remove the eddies and to control the uniformity of the speed. These baffles consist of 64 cells, each 1 foot square and 8 feet long. Each cell is provided with its own damper, so that the velocity of the air in any one section may be controlled. At the experimental chamber in the vicinity where aeroplane wings or models are tested the maximum variation from uniform flow is about 2 per cent.

The tunnel is built of wood, with frames spaced about three feet on centers placed outside and sheathed on the inside with  $\frac{7}{8}$ -inch tongued and grooved sheathing laid in two thicknesses in the direction of the air current, and with building paper placed between the two layers. The necessary curvature is obtained by bending the sheathing, the whole of which is blind nailed.

The fan is driven by a 250-volt, 500-horsepower, direct current motor, arranged for operation on the Ward-Leonard System. The motor also has auxiliary field control, so that any desired speed up to about 200 r. p. m., which corresponds to a wind speed of 75 miles an hour, may be obtained. At the discharge side of the fan are located 12 pitot tubes which lead to an integrating manometer which gives the average velocity of discharge. This velocity has been calibrated against the velocity obtained at the section in the experimental chamber where the aeroplane or other model is placed, so that any desired velocity may be obtained at that point with precision without having any pitot tubes or obstructions other than the model being tested. In other words, by calibration the velocity of discharge may be found, and this bears a certain constant ratio to the velocity at the experimental section.

The velocities were determined by pitot tubes which were checked with those used in the Aerodynamical Laboratory of the Massachusetts Institute of Technology, and in the National Physical Laboratory in England.

Among recent investigations of interest made at the Wind Tunnel was the determination of the coefficient of air friction for various aeroplane and balloon fabrics. Tests have been made on the new dirigible building for the Navy Department and on models of Naval aeroplanes both building and projected. A number of tests have also been made for private concerns. In carrying out experiments for private parties the same practice is followed as in the case of tests of ship models; that is, the actual cost of doing the work is charged in each case. On account of the large size of the tunnel it is possible to test comparatively large models of aeroplanes with widths up to 36 inches.

In Figure 2 is a photograph showing the arrangement of the model of an aeroplane when being tested. The model is carried by a steel spindle which extends up through the top of the tunnel to the weighing balance which is placed overhead. For about two-thirds of the length in the tunnel the spindle is covered by a mask of streamline form. This mask is secured to the ceiling of the tunnel and reduces

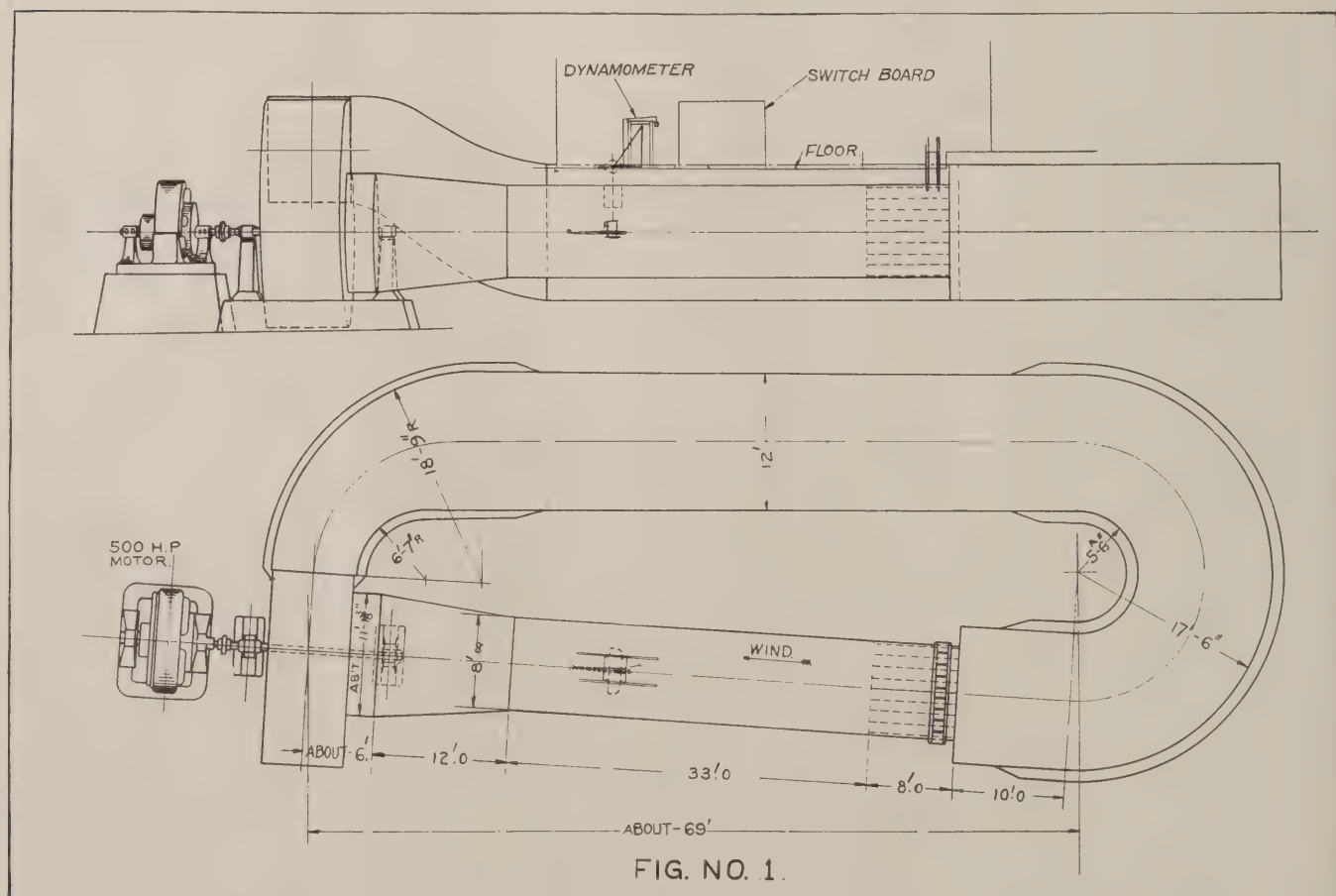


FIG. NO. 1.

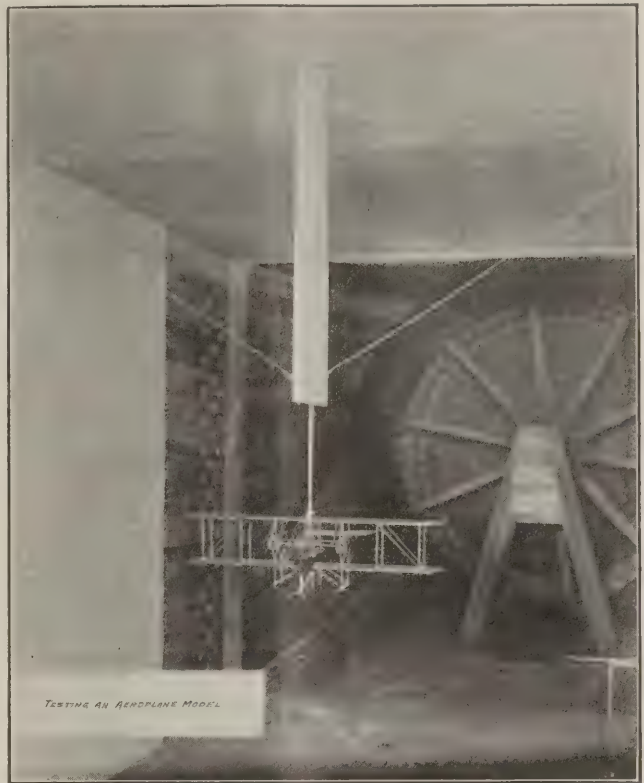


the force acting on the spindle itself, and thus the spindle correction. The weighing balance consists of a weighing scale on the platform principle having three axes, two of them at the same horizontal line 61 inches apart, and the third vertically over one of the first, 48 inches above it. When a model is set at a given angle, the moments acting about each of these axes is measured by weighing them on the scale. With this data it is possible to compute horizontal and vertical components of the force acting on the model, that is, the drift and lift, and also to compute the line of application of the force. Tests are usually made at speeds of 40 miles an hour. At this speed and at the angle of least resistance an ordinary aeroplane wing model has a horizontal resistance of something less than one-tenth of a pound. It is therefore necessary that the balance should be capable of weighing a force with accuracy to about 2/1000ths of a pound.

The large size of the tunnel makes it possible to test full size radiators for aeroplane motors and comparative tests have recently been made on several types both as to air resistance and cooling capacity.

The Wind Tunnel has also been used for certain other tests which are not directly connected with aeronautics, such, for example, as the determination of the influence of form and dimensions on the size of ventilating cowls for use on ships. These tests have shown that it is not necessary to exceed certain dimensions which are less than have heretofore been used in many cases. It is proposed shortly to obtain the wind resistance of a large battleship, this being an element of a ship's resistance which has not previously been accurately measured.

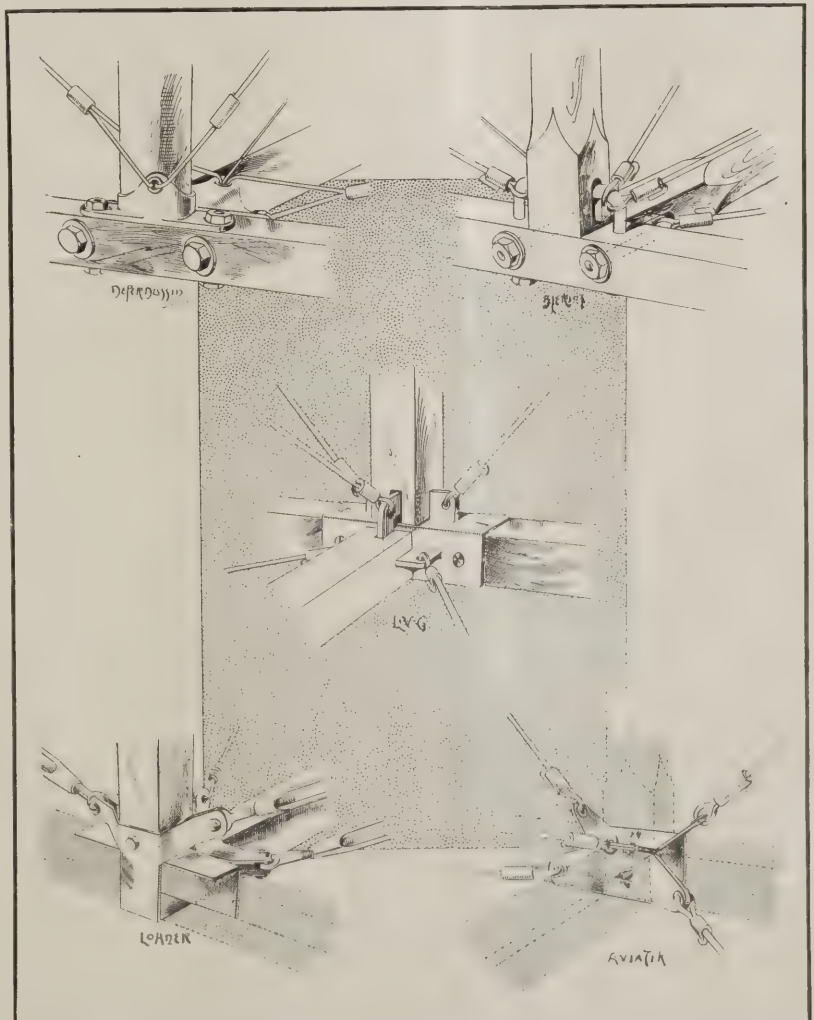
In conjunction with the Wind Tunnel, the Model Basin is used for determining the best form of floats for hydroplanes, and there will no doubt be many other cases where the data derived from tests made in the water may be applied directly to aeroplane design.



TESTING AN AEROPLANE MODEL

## Typical Austrian, German and French Fuselage Joints

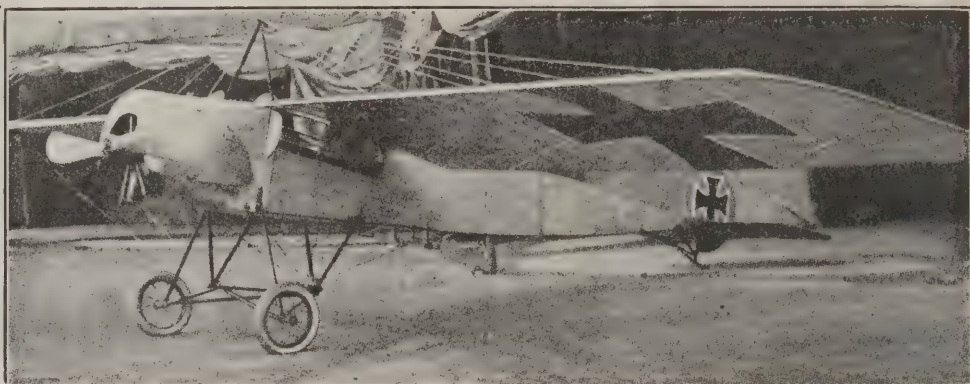
THE fuselage joints shown in the accompanying sketches are typical of the methods employed by German, French and Austrian constructors to form a joint between the longerons, struts and cross members. The L. G. V. and the Aviatik are representative of two of Germany's well known manufacturers and the Lohner is regarded as typical of the practice adopted by Austrian constructors. In these joints, as in the set of English fuselage joints illustrated heretofore, the piercing of the longeron has either been avoided or been reduced to a minimum. It will be noted that the L. V. G. device has the added advantage of being applicable to a wide range of sizes.



Austrian, French and German Fuselage Joints.



## THE FOKKER MONOPLANE



**I**N a captured German Fokker monoplane, British experts see the German adaptation of a successful French type, with some modifications that are improvements, but with other modifications that more than offset the slight constructional advances made back of the German lines.

In the Fokker the French Morane-Saulnier idea has been cribbed without improving on it as a whole or without improving on the British adaptation of this machine as produced by the Graham-White Aviation Co. The captured machine differs from the original in its proportions and in the wing section, the latter being radically changed from the French monoplane in that the nose or leading edge is flatter and the lower camber entirely different with its maximum ordinate much farther back from the leading edge.

The most marked departure in the constructional work is that with the exception of the wings the body is built entirely from steel tubes. Opinions will differ as to whether this form of construction is an improvement over the monoplane constructed from wood. While the tubes are strong, and an effort has been made to protect them from the action of the weather by covering them with some material looking like oil cloth, still the fact remains that the strength of any one tube, and hence the efficiency of the whole machine may be dangerously impaired through some cause which, with other material, would be trifling. A slight dent may be made in a tube in landing, by the dropping of a tool or even by a misstep when the machine is on the ground. Nevertheless,

the longitudinals, the cross-members and the struts are all made of steel tubing, but the wings have spars and ribs of wood.

The body is a rectangular section, like the Morane from which it has been copied, tapering to a horizontal knife section at the rear. The horizontal stern post is a steel tube which serves as a bearing for the main transverse tube of the elevator. This member is also built of steel tubes. The rudder consists of two semi-circles with the smaller in front of the rudder post, thus bringing the centre of pressure and the centre of support closer together than they are in an unbalanced rudder. A short skid, sprung in the usual manner with rubber bands, prevents the tail from coming in contact with the ground.

There is a cockpit for pilot and passenger, but while the former has a seat, the latter has only a board to sit on behind the pilot.

There is no radical departure in the controls—a central column for the warp and elevator and a pivoted footbar for the rudder, but the top of the lever is terminated in a double handlegrip, and on the central portion of this handle the constructor has mounted the cut-out switch for the engine, in a position convenient for operation by either hand.

In order to improve the view of the occupants which, on account of their position between the main spars of the wings, would be otherwise restricted, the leading and trailing edges have been cut away near the body, as the sketches show, and "windows" have been provided in the upper half of the body at the sides, for convenience in firing downward, and to aid the gunner in accuracy which would be impaired by the rush of the wind, a small wind screen has been placed at the forward end.

Aluminum sheeting encloses the front of the body and a cowl of the same material covers the upper half of the engine. At the rear of the cowl there are two curved shields which prevent the oil thrown out by the engine from being blown back along the sides of the body.

The engine is an Oberursel, the German type of the Gnome. It is of 80 h. p., and drives an Integral propeller 8 feet, 4 inches in diameter. The engine is mounted on overhung bearings. The gasoline service tank and the oil tank are mounted in the front of the body and the reserve gasoline tank is placed just back of the cockpit. On top of the engine cowl and in front of the wind shield there is a gasoline gauge, or as the German's call it a "Benzil Uhl."

The accompanying sketch will show a noticeable departure from the original French design in this German modification of the undercarriage. A longitudinal member, formed of a steel tube, is carried on two pairs of "Vee" steel tubes secured to the lower longitudinals of the body. Near the point of attachment of the front "Vee" the two stub axels are hinged to this tube. The stub axels slope downward toward the wheels; two other tubes slope upwards to the sides of the body where they are lined to short transverse horizontal levers pivoted centrally in the floor of the body. The springing is provided by shock absorbers wound around these levers and a transverse strut in the body.

The wing plan of the captured monoplane does not show any great change from that of the machine from which it has been patterned, but the ends are considerably raked to give an increase to the effectiveness of the warp. The main spars are of I section wood fitted at the root with a socket terminating in an eye through which a short bolt passes, and with which the spar is secured to the corresponding lug on the side of the body. A short distance in front of the chassis struts, on each side of the body, there is a bracket with an eye on its outer edge of the same size as that of the spar

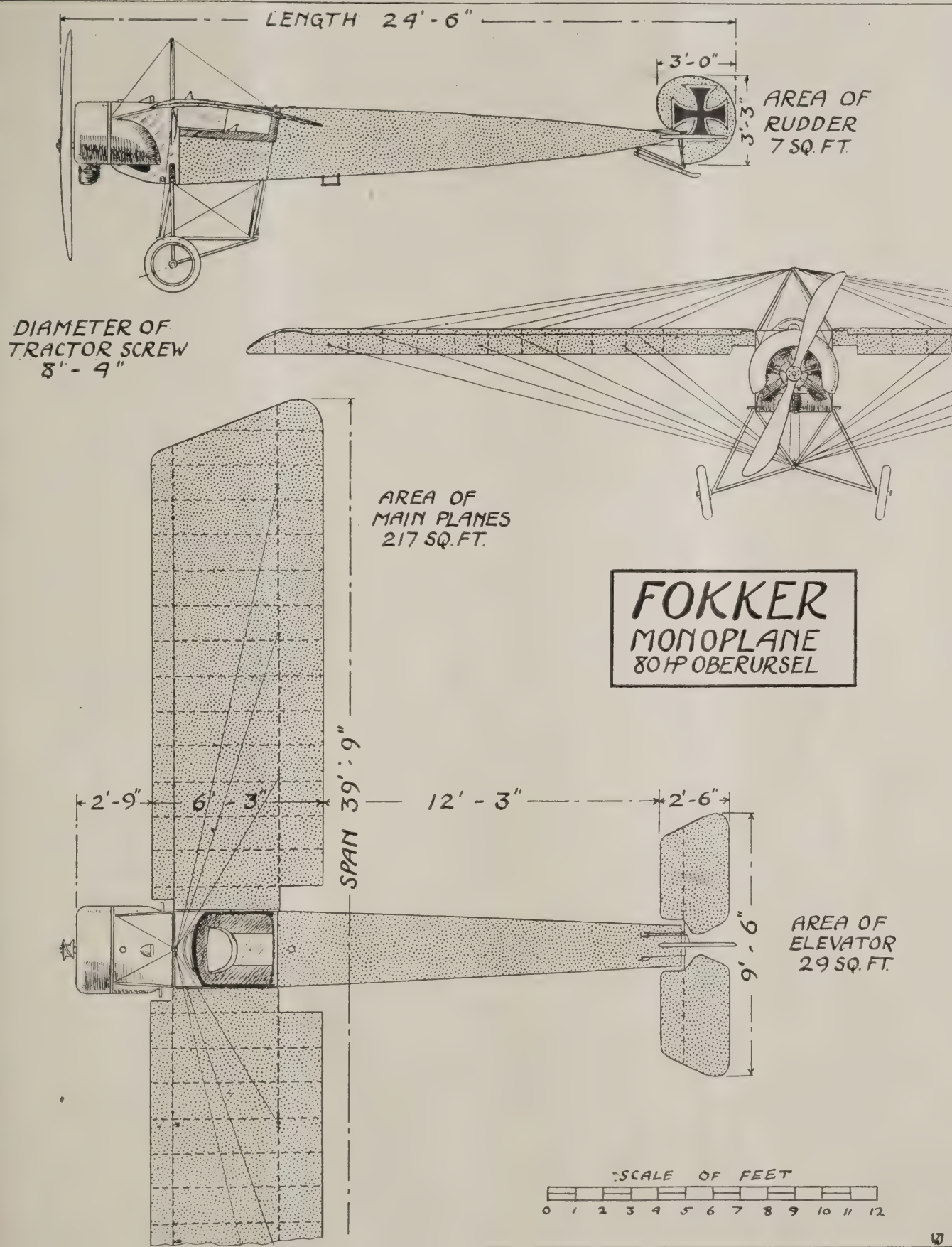


Fokker Under-carriage and Engine Housing.



lug. Thus, when it is desired to transport the Fokker, as merchandise, the wings are detached, the front spar is placed with its root on this bracket, and the same bolt that is used for securing the spar in flight, is used to secure it to the bracket for transport. A steel hook, bolted to the

spar near its outer edge fits into the socket a few inches in front of the tail skid attachment. The wings are now folded along the sides, like the wings of a bird at rest and when a couple of straps have been passed around the wings to add to their security, the machine is ready for shipment.







# FOREIGN NEWS



## FRANCE

"French aviators have dropped bombs on Petrich, Strumitsa and other towns where troop movements have been observed. The bombs apparently caused a considerable number of casualties, especially in Petrich, where they were seen to explode in the centre of the town, causing buildings to collapse and fire to break out."

Lieutenant Louis Paulhan, the aviator, has been commended in army orders for bringing down a German aeroplane behind the German lines and then volplaning low and dropping a bomb on the machine for the purpose of destroying it.

Criticism has lately been directed against the Under Secretary for aviation on the ground that France was falling behind in aviation equipment. M. Laffont, a certified aviator in a communication in the *Petit Journal*, says that public uneasiness should be promptly ended and gave notice that he would interpellate the government to the end that the criticism, if unjust, shall be ended, or the defect in administration, if there be one, shall be corrected.

Deputy d'Aubigny, president of the sub-committee on aeronautics of the Chamber of Deputies Army Committee, acknowledges in a public letter that a critical point has been reached in this branch of the service. He asserts that the output of aeroplanes in November was 25 per cent less than in September, and that the number produced in December will show a further falling off.

"We had made real progress, as compared with the situation at the beginning of the war," says the Deputy. "The result was that in March we had a distinct superiority over the enemy. But at the present time we are notoriously inferior to him."

The Deputy's statement closes with an appeal to the War Ministry to disregard administrative routine and improve the output of aeroplanes in both quantity and quality.

## GERMANY

The Petrograd Gazette says that in a voyage over Warsaw in a Zeppelin the Kaiser's life was imperiled. "One of the screws of the Zeppelin broke," says the correspondent, "tearing a great hole in the aluminum envelope. The airship began to list heavily and a parachute was prepared for the Kaiser's use."

"The Commander of the Zeppelin telegraphed to earth and the whole countryside was roused, cavalry and motors being sent flying in all directions to assist, if possible, in an emergency landing. The engines were stopped, everything of weight was flung overboard, even to the officer's swords, but the huge machine continued to fall."

"At the last moment the anchor caught in some trees and, though damaged, the Zeppelin reached the ground without actual disaster. Every officer and man concerned received a reward from the Kaiser in person."

It is announced that an allied aircraft attack upon Douai failed. German aviators shot down the British aeroplanes. One of the machines was brought down by Lieutenant Boelke, this being the seventh aeroplane that he had succeeded in disabling.

Two German aviators just captured by the Russians described the new German aeroplanes. They are of the albatross type, fitted with transparent wings, which are impregnated with a secret composition. While the planes are not entirely invisible, they make difficult targets, as they always appear to be flying much higher than they really are.

## GREAT BRITAIN

Owing to the fear of poison gas being dropped into London through the agency of Zeppelin bombs there has been a great sale of respirators. Prof. Leonard Hill, in a recent lecture, declares that the respirator was worse than useless and therefore the sale was a fraud. Owing to the enormous ventilating power of the air, he says, there is no reason to fear that Zeppelins will drop poison bombs on London.

## GOLD COAST, AFRICA

In addition to other sums, the government of the Gold Coast has received a contribution of \$7,500 for the purchase of an aeroplane to be presented to the Royal Flying Corps of Great Britain. This sum has been given by the Omani and the people of the division of Akim, Abuakwa.

"An Austrian aeroplane fell near Dulcigno and the aviators were made prisoners."

## GREECE

In reprisal for a German aeroplane attack against Saloniki by the Germans the French commander ordered to the arrest of the German, Austrian, Turkish and Bulgarian consuls. British and French troops surrounded the consulates, arrested all the members of their staffs and seized the archives.

## JAPAN

C. H. Holmes and B. J. Williams, who formerly conducted a school of aviation at Los Angeles, Cal., have established themselves in Kobe, Japan, and despite the difficulties of doing technical work in a foreign country have built their first aeroplane in Japan and expect also to open a school of instruction there. The new machine is a tractor biplane, equipped with a Curtiss engine, with a maximum speed of 75 miles. It will carry two men, fuel for four hours and an additional load of 500 pounds. With a full load the machine, it is announced, will climb to a height of 4,000 feet in ten minutes. The spread of the wings from tip to tip is 35 feet, and from propeller to rudder the distance is 23 feet. Messrs. Holmes and Williams hope to manufacture some machines for the Japanese government whose aerial fleet is rather small. The Imperial government is, however, fully alive to the importance of rapidly de-

veloping aviation strength for both its army and navy, and the Americans, therefore, see in the Island Empire a fine field for operations. During the time that they were engaged in business in California they instructed and graduated seven Japanese in aviation, five of whom are at present residing in Japan.

An aviation meet held at Naruo, under the auspices of the Kwansai Aviation Club, was marked by a number of unforeseen incidents none of which, however, caused injury to aeronauts or to spectators. On the first day, Mr. Nakazawa, flying at a height of 500 feet encountered erratic gusts of wind which blew him seaward and compelled him to descend. On the afternoon of the same day his machine lost its equilibrium and fell about 100 feet, but the aviator recovered his balance and made a safe landing on water from which he was brought ashore by a fishing boat.

During the second day of the meet Aviator Takaso was flying at a height of 1,500 feet when the sound of the motor suddenly ceased. This was followed by the sudden appearance of a cloud of black smoke and a loud report. The cylinders on the sides of the oil tank had been rent apart, but despite that the aviator was able to make a safe landing in the river. On the same day, Aviator Nakazawa gave a fine exhibition of flying at altitudes ranging from 500 to 3,000 feet.

In December the Emperor reviewed 125 Japanese warships in the harbor of Yokohama. Seven aeroplanes participated in the demonstration rising simultaneously to welcome the Emperor as he boarded the flagship. After the review one of the machines in returning to the aeronautic station was upset by a sudden gust of wind and Major Tada and Sub-Lieutenant Aoki were thrown into the sea. Sub-Lieut. Aoki was killed. He had an excellent record and in appreciation of his abilities the government had only a few days before his death assigned him to a year's study at the Curtiss factory in Buffalo.

Mr. Nishi, a mechanic working in the Kure Naval arsenal, recently invented a bomb to be used by aeroplanes. The government refused to make use of it and he later sold his invention to the British government.

The Minister of War has ordered the formation of an aerial battalion consisting of two companies, and all aviation corps will belong to this battalion, which will be commanded by Col. T. Arikawa.

Japanese papers say that Charles Niles, of New York, has aroused the greatest enthusiasm and admiration wherever he has appeared by his feats of daring. His work has been brought to the attention of the Emperor and a special exhibition is being held for that dignity.

## MONTENEGRO

One of the curious twists of war is revealed in an announcement from Montenegrin Consul General in Paris, who says that in a recent attack on Podgoritz by Austrian aeroplanes the bombs thrown down killed two persons—Austrian prisoners of war.

## NEWFOUNDLAND

Sir William Duff Reid, President of the Reid Newfoundland Company, who was recently knighted by King George, has made substantial contributions to the armament of the Allies in aeroplanes and machine guns. Two of his sons are at the front. Each holds the rank of lieutenant, the young men being in the Naval Aviation Corps.

## SERBIA

Allied airmen bombarding Givgeli, Southern Serbia, in the course of a reconnaissance, destroyed the sheds in the German aviation camp.

Aeroplanes were used for ambulance work for the first time on record during the retreat from Serbia by the French military mission. The Balkan mission was at Prisrend. There were many helpless persons. It was impossible to carry them on stretchers, but it was determined not to abandon them. The French still had six aeroplanes. They had been exposed to rain and snow for two months, but were still in working order. Colonel Fournier placed on these aeroplanes the persons whose condition was most grave and sent them by air to Scutari.

## SWEDEN

Some excitement has been occasioned at Halmstad by the hovering of a Zeppelin over the harbor, as it was believed by the military authorities that the airship was contemplating the capture or the release of the American steel bark Andrew Welch, held there under military guard. The Andrew Welch is owned in San Francisco and carried a cargo of beans consigned to a nonexistent firm. When her skipper asked for permission to go to Malmo the Swedish authorities refused it and set a guard over her.

## TURKEY

Off the Anatolian Coast, near Akbanca Lieut. Ryck Boddike, attacked a French aeroplane and brought it down. The aviator was found to be dead. The damage to the aeroplane can be easily repaired.

## RUSSIA

The Zeppelin which was destroyed near the station of Kalkun, on the Libau-Romin railway, testifies to the great accuracy of Russian artillery. One shot struck the great ship fairly and it presently was lost to view in a cloud of smoke.

"A Zeppelin recently flew over the Dvinsk district and dropped bombs, some of them falling into the German trenches and causing heavy losses and a panic among the Germans."





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
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**PLATTSBURG MODEL AERO CLUB**  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

## How To Construct and Fly Model Aeroplanes

By G. A. CAVANAGH

### Assembly

In the issue of January 10th the construction of the frame of the model was fully described, thus completing the three most important parts of a simple model aeroplane, with the exception of the rubber for motive power. To achieve the best results a model builder must properly assemble, and this cannot be done without explanation to the inexperienced builder. The proper handling is likewise essential, but this will be explained in a subsequent article.

Now that the completed parts of the model are ready for assembling, the first thing to be done is to mount the propellers. This requires carefulness, for it is a very easy thing to bend a propeller shaft, and in such a case trouble is inevitable, as a bent propeller shaft will cause the propeller to wobble and lose pitch. Before inserting the propeller shaft in the tubing, however, cut out four small hard metal washers about one-quarter of an inch in diameter with a hole in the center just large enough to permit the propeller shaft to pass through. When these have been put on, thus preventing the tubing from cutting into the hub of the propeller, hold the inside end of the shaft which extends out toward the point of the model and bend into a hook, as shown in the drawing herewith. The metal washers are now passed over the straight end of the shaft which extends out from the rear of the tubing. The propellers are next to be mounted. This may be done by allowing the shaft to pass through the hole in the hub of the propeller. Remember that the STRAIGHT edge of the propeller faces the POINT or FRONT of the model. About one-half inch of the propeller shaft should extend out from the hub of the propeller, so that it may be bent over to grip the hub of the propeller.

To propel the model, eighty-four feet of one-eighth inch flat rubber is necessary. This may be strung on each side of the model from the frame hooks at the forward part of the model to the propeller shaft at the rear of the model until fourteen strands are evenly strung on each side of the frame. To facilitate winding bend two double hooks from a piece of wire so that they will resemble a letter S; one end of the hook is caught on to the frame hook while the other end is attached to the strands of rubber. To prevent the hooks from cutting into the rubber a piece of rubber tubing is slipped on to the end of each hook to which are attached the rubber strands. On to the propeller shaft is slipped another piece.

By the use of rubber bands the wings may be attached to the frame. This may be done by laying the wing upon the frame so that the entering edge or front edge of the wing is facing the point of the model. Both wings must be placed so that there is an even amount of surface on either side; the main wing being placed about six inches from the rear and the small wing or "elevator" about six inches from the front. Next cut out a small block about one inch long, one-quarter inch high by one-quarter inch wide to

place under the entering edge of the "elevator" for proper elevation.

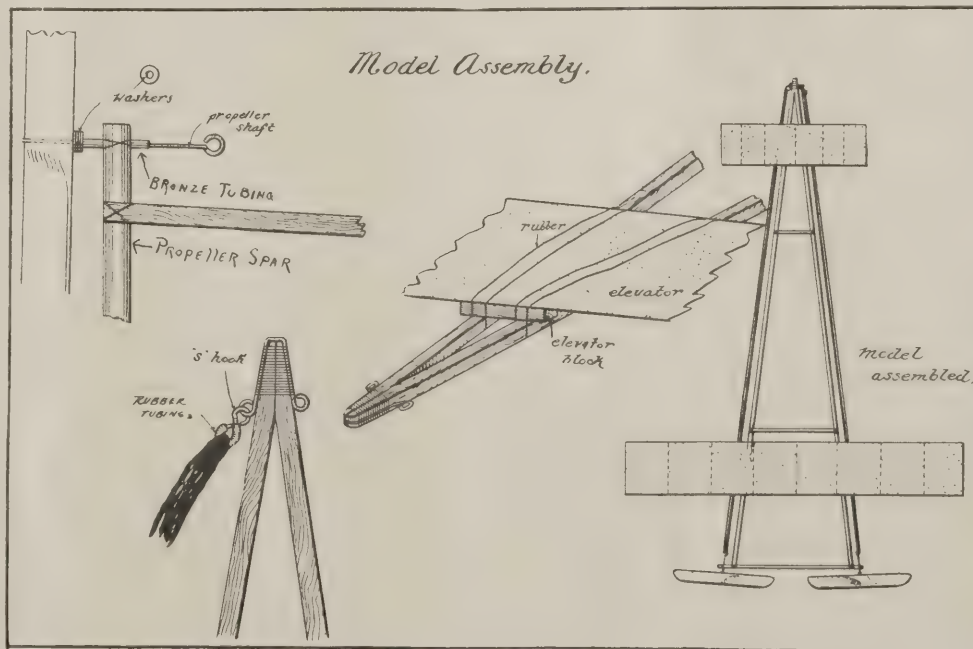
Now that the model is properly assembled the next step is the proper handling to obtain the best results. The secret of good flying is the manner in which the model is handled on the field as well as the way in which it was made. The way to fly the model will be fully described in the following article to appear in the issue of January 24th.

### Aero Science Club of America

At the last meeting the Club had the pleasure of hearing Mr. A. Seidel speak on the subject of Zeppelin airships. Having had considerable experience with this type of airship abroad Mr. Seidel's talk was of exceptional interest. He is he claims many advantages. Messrs. Durant, Hodgins and Thiele, the latter having witnessed considerable aeronautical activity abroad, took part in the general discussion pertaining to Zeppelins.

At the next meeting Mr. John McMahon will talk on the subject of Compressed Air Motors, at the same time exhibiting some samples of his work. Mr. McMahon has had quite extensive experience with compressed air driven motors and without doubt the lecture will be most interesting and instructive. Mr. C. W. Meyers is now working on plans for a large biplane glider which he hopes to have completed by Spring. Mr. Meyers has had considerable experience with gliders, having built two during the past few years.

On Thursday, January 13th, Mr. Cavanagh will represent the Club at the Y. M. C. A., Orange, N. J. Mr. Meyers was present at the last meeting of the Elmwood Avenue School Model Club. This club, Mr. Meyers reported, was progressing very rapidly and will undoubtedly be in possession of a number of flying models before Spring. For further particulars address the Secretary, 29 West Thirty-ninth St., New York City.







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### At the Aero Banquet

"Mistah Interlocutah, what would yo' do if all de cornet playahs ob dis band should go on a strike?"  
 "Ah dunno, Mistah Bones; what would ah do if all de cornet playahs done went on a strike?"  
 "Ah dunno, Mistah Interlocutah, but ah reckon dat you would hab t' get some subs-toot. Am ah right?"

Two Jew aviators were walking down the street one cold winter day. Both wore huge o'coats and were swathed in mufflers.

Ikey—"Izzy, vy don'd you say somet'inks?"  
 Izzy—"Freeze your own hants, damn it."—*Awgawm.*

#### A Good Suggestion

Kentucky Tailor—"And the hip pockets, Colonel, what size shall I make them—pints or quarts?"—*Awk.*

The young aero student had just been turned down by his lady and the next morning went to the butcher shop. This occurred:

Y. M.—"Have you any nice beefsteak this morning?"  
 Butcher—"Sure, here's some as tender as a woman's heart."  
 Y. M.—"Give me a pound of sausage."—*Widow.*

#### Motor Trouble

Mr. Pecan—"What seems to be the trouble, James?"  
 James—"One of the cylinders is missing, sir."  
 Mr. Pecan—"My word! Where do you suppose we lost it?"—*Lehigh Burr.*

#### No More

"Flying is dangerous business. Never again for me!"  
 "Why, I didn't know you had ever been up in an aero-plane."  
 "Who said I had? I was referring to the flyer I took in the stock market last week."

#### Gasoline Debit

Paul—I wonder how much Allfront is worth?  
 Fred—I don't know what he's worth, but if you'll tell me his horsepower I'll tell you his mortgage.

#### Registered

Floorwalker—Looking for something, madame?  
 Aviatrix—Husband.  
 F. W.—First aisle to your left—male order department.

#### Laconic Reasoning

Old Sport—Sir, may I see your invisible aeroplanes?  
 Clerk—If they were, how could you?

#### In Physics

Prof.—When two bodies come together with some force, is heat generated?  
 Aviation Student—Not always, Sir. I hit a guy once, and knocked him cold.

#### Passed the Test

"So you want to marry my daughter, eh?" shorted the old man. "Do you consider yourself fiancially able to do so?"  
 "Well," replied the aviator, "after a fellow has bought candy and flowers for a girl for a year, and has taken her to the theatre twice a week and is still not broke, I guess he can afford to get married."—*Philadelphia Record.*

#### Not in Aviation

Young Man (in aisle)—"Permit me to open the window for you?"  
 Pretty Girl—"Why—but there's a tunnel right ahead!"  
 Y. M.—"Of course."  
 P. G.—"Oh, well—"  
 (Tunnel)—*Stanford Chaparral.*

A self-made man is not always a well-made man.  
 Hangers-on are only welcome by the street car companies.  
 Few can wear an air of importance without its seeming a misfit.

Even a stingy man will allow another to share his opinion.  
 Unfortunately the fire of genius cannot always keep the pot boiling.

Time flies, and no wonder when so many are trying to kill it.

A man who tries to belittle others must be little himself.  
 Even a man who is always on the level has his ups and downs.

### MUTT AND JEFF—Jeff Stalled the Motor and Mutt Stalled the German . . . BY BUD FISHER

(Copyright, 1918, by H. G. Fisher—Trade Mark Reg. U. S. Patent Office.)



Courtesy N Y. World.



G. DOUGLAS WARDROP

Managing Editor

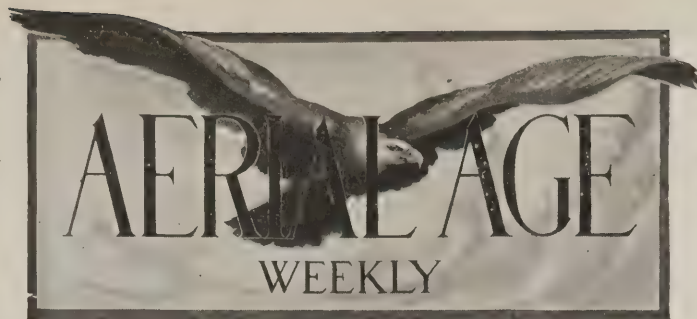
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VOL. II.

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No. 19

### General Scriven Urges 648 Aeroplanes for Army (From The Tribune Bureau.)

AT least eighteen aero squadrons, each with thirty-six aeroplanes, should be created under the proposed increase of the army, instead of an increase of only four, as proposed in the War Department plan, General George P. Scriven, chief signal officer of the army, told the House Military Affairs Committee to-day. General Scriven said the coast artillery districts and each field battery should be supplied with machines for fire control and scouting work.

General Scriven surprised the committee by urging the repeal of the restrictions in the existing law requiring student aviators to be unmarried officers under thirty years of age. Whether an aviator was married or not was a personal matter, he said, and the age limit resulted practically in the corps having only untried men to draw on.

The corps, the witness continued, was meeting with great difficulty in getting the full number of officers already authorized, because under the restrictions there were only 668 eligible officers in the entire army, while at least one-fifth of these would fail to pass the physical test if all should volunteer.

As to the capacity of American plants to turn out a sufficient number of aeroplanes in the event of war, General Scriven said he figured the capacity of American factories at twenty complete machines a day.

### Inglis M. Uppercu Presents Hydroaeroplane to Naval Reserve of New Jersey

A HYDROAEROPLANE of the pontoon type is the latest substantial contribution to the National Aeroplane Fund, which was instituted six months ago by the Aero Club of America for the purpose of developing aviation corps in the Militia of all the States, and which has already resulted in the Militia of twenty-four States taking up aviation.

This generous gift to the Naval Reserve of New Jersey was made by Mr. Inglis M. Uppercu, a member of the Aero Club of America and President of the Aeromarine Plane & Motor Co., of Nutley, N. J., and New York City. Mr. Uppercu is also president of the Cadillac Motor Car Co. and is deeply interested in adequate preparedness, particularly in the Militia. The machine will be used for teaching officers of the New Jersey Naval Reserve to fly.

In his letter Mr. Uppercu, after describing the type of machine and the size of the motor, says: "I sincerely hope that this will be of some benefit to the Aeronautic Section of the National Guard, and that it will be instrumental in furthering your plans for a flying corps representative of the State of New Jersey." The machine, which has been donated to the Naval Reserve, State of New Jersey, is an aeromarine pusher type biplane motored with the latest type six-cylinder vertical motor. This is the type of motor used by Mr. Art Smith in his aerial evolutions over the Hudson River and at the Panama-Pacific Exposition last summer, most of which were carried out at night, with the machine illuminated with myriads of electric lights. The hydroaeroplane will be equipped with landing gear which will enable it to alight equally well on land and water, and will be equipped with modern devices for observation and machine control.

This gift has been transmitted through the National Aeroplane Fund to the Honorable James F. Fielder, Governor

of New Jersey and Commander-in-Chief of the Organized Forces of the State, and Commander Edward McC. Peters, of the Naval Reserve of New Jersey.

The National Aeroplane Fund, realizing that funds will be needed for the upkeep of the machine and for fuel and oil, has given \$500 for this purpose. Ensign J. Homer Stover, in charge of the aeronautic section of the Naval Reserve, is now selecting the personnel for the corps, four men of which are to receive instruction in flying at the Sloane Aeroplane School, at Garden City, New York. Mr. John E. Sloane, President of the Sloane Aeroplane Co., has offered to train these officers of the Naval Reserve—two as pilots and two as mechanics. It is considered advisable to have four men so that the development of the corps will not be hindered in case one or two of the members should not be able to be present.

The offer of this aeroplane to the Militia of New Jersey brings the total number of States who have received, through the National Aeroplane Fund, aeroplanes or the means with which to purchase them, to seven, with a total of eleven machines. The first organization to receive the gift of an aeroplane was the Naval Militia of New York, which was presented with a flying boat by Glenn H. Curtiss, President of the Curtiss Aeroplane Co., of Buffalo. This generous gift was soon followed by the gift of \$10,000 to the National Guard of New York by a prominent woman who asked that her name be kept from the public. Next came the offer of a flying boat for the Militia of Wisconsin, by Mr. B. R. J. Hassell, a sportsman of Milwaukee. This was closely followed by the offer of five training aeroplanes to the Militia of California (three), Texas and Arizona, by Mr. Earle Remington, a California sportsman. Miss Lyra Brown Nickerson, of Providence, R. I., then sent a check for \$7,500 to the National Aeroplane Fund for an aeroplane for the Militia of her State, and \$14,000 for the purchase and upkeep of another aeroplane has been subscribed to the fund of that State.

Funds are now being raised by twenty other States for the purpose of organizing aviation sections in the National Guard and Naval Militia. The State of Maine, according to a telegram just received by the Aero Club of America, has raised \$7,500 and at the date of writing expected to raise the balance of \$10,000 within a few days. Detroit, Mich., has raised \$1,800 without special effort, and expects to raise the balance of \$10,000 for an aviation detachment before February 1, 1916. In accordance with an offer made several weeks ago the National Aeroplane Fund will pay 10 per cent. on any amount up to \$10,000 raised by any responsible organization, Chamber of Commerce, or individual for the National Guard or Naval Militia of any State.

The National Aeroplane Fund has received recently, besides the aeroplane from Mr. Uppercu, contributions as follows:

Emerson McMillin, \$1,628; L. M. Osborne, \$250; E. M. Herr, \$250; Alexander Forbes, \$200; Frederic S. Gould, \$100; Kenneth S. Dows, \$100; V. Everitt Macy, \$100; "A New York Woman," \$100; Henry S. Kip, \$100; Mr. and Mrs. Geoffrey G. Whitney, \$100; Jules Vail, Paris, France, \$100; G. R. Aggasiz, \$100; Benjamin C. Allen, \$100; Mrs. Mary G. Hinkle, \$100; Robert Saltenstall, \$100; Owen Clark, \$100; Lester Leland, \$50; William Emerson, \$50; Mrs. Ballard Smith, \$50; Mrs. H. S. Bowen, \$50; D. B. Fay, \$50; Mrs. Louise Chase Myers, \$50; Mrs. O. A. Campbell, \$25; Guy Cunningham, \$25; Mrs. Heth Lorton, \$25; Mrs. Harold Dana, \$25; Eugene Levering, \$25; Wm.

**America Must be Given a Navy Equal to the Best.** If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.



Power Blodgett, \$25; F. P. Sprague, \$25; Mrs. Julia Tilford, \$25; "R. S. D.," \$15; Mrs. William Hamilton Russell, \$10; B. C. Brown, \$10; R. U. Sherman, \$10; Miss Dorothy Salisbury, \$10; George Crompton, \$10; Mrs. William Emerson, Jr., \$10; Dr. and Mrs. G. W. Jean, \$10; W. K. Wallbridge, \$10; C. F. Ayne, \$10; John G. Thomas, \$5; Fritz B. Talbot, \$5; Ernest T. Carter, \$5; Joseph D. Holmes, \$5; J. D. Pearmain, \$5; Alfred N. Martin, \$3; George A. Gibson, \$2; Raymond W. Bristol, \$2.

#### Alexander Graham Bell Urges Aeroplane Mail Lines

ALEXANDER GRAHAM BELL, the telephone wizard and pioneer experimenter in aeronautics, has asked the Aero Club of America to urge Congress to establish air routes wherever possible throughout the United States, so as to bring in use thousands of aeroplanes which, while being employed daily for peaceful purposes, shall form a valuable reserve of trained aviators and partly supply the aeronautical deficiencies of the Army, Navy and Militia.

In making this recommendation Dr. Bell dwells on our backwardness in aeronautics as follows:

"Aviation originated in the United States, but we have been left behind in the struggle for progress. The necessities of the European war have advanced aviation far more in Europe than here. It becomes our duty to prepare. The heavier-than-air flying machine has revolutionized warfare, and what are we to do when war comes here? It is easy enough to make machines, but how about men? We must prepare men; we must have aviators not by the handful but by the hundreds, by the thousands! How are we going to do this?"

"That is what we have got to look to. How are we going to get these aviators trained before the occasion comes for their use in war? It is obvious that we must find use for them in peace. We must find occupations for multitudinous aviators, and it seems to me that one of the plans that has been proposed, and which has not been elaborated here, has in it the prospect of great success; it is to use the flying machines in the Postoffice. There the Government can assist us. If we have hundreds of postal air routes, with men carrying mails day after day and week after week we will have a vast number of trained aviators, accustomed to flying and intimately familiar with the appearance of the land over which they pass. I would suggest that the Aero Club of America could do nothing greater or better to advance our position in the world of aviation than to urge upon Congress the establishment of postal air routes in multitudinous places over the United States!"

The recommendation of Dr. Bell will be considered at the next meeting of the board of governors of the Aero Club, when there will also be considered a plan to establish the first forty-three aeroplane mail routes which has been made by the Postoffice Department. It is anticipated that the Board of Governors will urge Congress to make the necessary appropriation for establishing these routes, which may amount to \$5,000,000, and will ask the thirty affiliated Aero Clubs to support this recommendation.

Some of the routes suggested by the United States Postoffice Department, where the aeroplanes can carry mail in less time than is required by other methods, are as follows:

Albany, N. Y., and Lake Placid, N. Y.: Rail distance, 142 miles; time, about 8 hours 10 minutes (depending on conditions at Bluff Point); air-line distance, about 112 miles; time, 2 hours 15 minutes.

Sag Harbor, N. Y., and New London, Conn.: Distance by water, via Shelter Island Heights and Manhasset Manor, 46 miles; time, 3 hours. Air-line distance, 25½ miles; time, 30 minutes.

Key West, Fla., and Havana, Cuba: Distance by water, 100 miles; time, southbound, 9 hours; time, northbound, 8 hours (R. M. S. gives time as 11 hours). Air-line distance, 100 miles; time, 2 hours.

Rolla, through Licking and Houston, to Cabool, Mo.: Not connected by railroad; distance by highway, 80 miles. Air-line distance, 60 miles; time, 1 hour 12 minutes.

Santa Maria and Shale or Maricopa, Cal.: Rail distance, 410 miles; time, 15 hours 10 minutes. Air-line distance, about 52 miles; time, 1 hour.

Bowman, N. D., and Newell, S. D.: Rail distance, 670 miles (no direct rail connection); star route distance, 122 miles; time on star route, not furnished. Air-line distance, about 100 miles; time, 2 hours.

Chamberlain and Winner, S. D.: Rail distance, 455 miles

(no direct rail connection); time, several days. Air-line distance, about 43 miles; time, about 50 minutes.

New Orleans and Houston, Texas: Air-line distance, New Orleans to Houston, about 320 miles; time, 6 hours 25 minutes. Air-line distance, Houston to Galveston, about 56 miles; time, 1 hour 7 minutes.

Roseburg, Oregon, and Marshfield, Oregon: Distance by rail and stage, 97 miles; time, 16 hours 30 minutes. Air-line distance, 47 miles; time, 1 hour.

Lewiston, Idaho, and Boise, Idaho: Rail distance, 455 miles; time, 40 hours. Air-line distance, 95 miles; time, hour 56 minutes.

Ashland, Oregon, and Klamath Falls, Oregon: Rail distance, 204 miles; time, 8 hours. Air-line distance, 48 miles; time, 1 hour.

Portland, Oregon, and North Yakima, Wash.: Rail distance, 378 miles; time 15 hours. Air-line distance, 130 miles; time, 2 hours 40 minutes.

#### Awards of Aero Club of America Aviation Medals of Merit

AT the recent Annual Banquet of the Aero Club of America the following awards of Medals of Merit were announced:

Lieut. P. N. L. Bellinger, U. S. N., for breaking American Hydroaeroplane Altitude Record. Height attained, 10,000 feet.

First Lieut. R. C. Bolling, for his efforts in organizing an aviation section in the National Guard of New York.

Oscar A. Brindley, for notable flight of 554 miles in the Curtiss Marine Flying Trophy Competition.

Lieut. J. E. Carberry, U. S. A., for breaking American Altitude Record for pilot and one passenger. Height attained, 11,690 feet.

Victor Carlstrom, for notable flight from Toronto, Canada, to New York City.

Lieut. Warren G. Child, U. S. N., in recognition of excellent work in developing machinery for aircraft.

H. K. Chow, S. B., S. M., honor man in aeronautical engineering, Massachusetts Institute of Technology, for 1915.

Lieut. H. A. Dargue, U. S. A., for flight of 192 miles for Curtiss Marine Flying Trophy.

Robert Glendinning, for flight of 160 miles for Curtiss Marine Flying Trophy.

George A. Gray, for participation, as aviator, in maneuvers of New York National Guard and Vermont National Guard.

Lieut. Jerome C. Hunsaker, U. S. N., in recognition of his excellent work in aeronautical engineering.

Lieut. Byron Q. Jones, U. S. A., for breaking American and American and World's Duration Records. American (pilot alone): 8 hours, 53 minutes. American and World's (pilot and two passengers): 7 hours, 5 minutes.

Beryl H. Kendrick, for flying from Albany, N. Y., to Ocean City, Md., in the Curtiss Marine Flying Trophy Competition.

Grover C. Loening, for meritorious development in steel aeroplane construction.

David H. McCulloch, for notable flight of 450 miles in Curtiss Marine Flying Trophy.

T. C. Macaulay, for two notable flights of 278 miles and 427 miles respectively, in Curtiss Marine Flying Trophy Competition.

Stephenson Macgordon, for breaking American Altitude Record for pilot and two passengers. Height attained 5,817 feet.

Captain Ralph McMillen, N. N. G., in recognition of his efforts in organizing an Aviation Section in Nebraska National Guard.

P. C. Millman, for participation, as aviator, in the Plattsburg Business Men's Training Camp.

Raymund V. Morris, for breaking American Altitude Record for pilot and two passengers. Height attained 8,024 feet. For breaking American Altitude Record for pilot and three passengers. Height attained 8,105 feet. For flight of 501 miles in Curtiss Marine Flying Trophy Competition.

Commander H. C. Mustin, U. S. N., for being the first to make a flight from the "North Carolina" on the new launching device.

H. C. Richardson, Naval Constructor, U. S. N., in recognition of achievements in designing aeroplanes and aeroplane floats.

W. C. Robinson, for participation, as aviator, in maneuvers of the National Guard of Iowa.

Lieut. R. C. Saufley, U. S. N., for twice breaking American Hydroaeroplane Altitude Record in one year, attaining height of 11,975 feet.



# THE NEWS OF THE WEEK

## American Society of Aeronautic Engineers Discuss Standardization

At a meeting of the directors of the American Society of Aeronautic Engineers which was held at the meeting rooms, 297 Madison avenue, New York, the following directors were present:

Bion J. Arnold, of Chicago; Edson F. Gallaudet, of Norwich, Conn.; Howard Huntington; Grover C. Loening, of Boston; Charles M. Manly, of Buffalo; Raymond B. Price; John E. Sloane; Elmer A. Sperry; Joseph A. Steinmetz, of Philadelphia; Clarke Thomson, of Philadelphia; Henry A. Wise Wood, the president of the society, and Henry Woodhouse. The following directors sent their proxies to the meeting: W. Starling Burgess, Glenn H. Curtiss, John Hays Hammond, Jr., Glenn L. Martin, William T. Thomas and Orville Wright.

Henry A. Wise Wood, the president, was in the chair.

Various matters concerning the organization of the society were discussed and settled, but the most important action taken was the provision for a Committee on Standardization, to be made up of subcommittees dealing with the following:

Engines and Power Plants; Magnetos; Carburetors; Starters and Accessories; Plane Construction; Boats; Pontoon, etc.; Navigating Instruments and Signalling; Propellers; Fuels; Hangars; Grounds and Docks; Controls; Wires and Cables; Metals (Iron and Steel); Aluminum and Bronze; Sheet Metals and Armor Plates, and Service Protection Steel Fittings and Cables; Fabrics, Covering, Dope, etc.; Woods; International Standards; Dirigibles and Balloons; Aerodynamic Data and Nomenclature.

Mr. Wise Wood was confirmed as president for the ensuing year. Those who attended the meeting are very enthusiastic over the progress being made in aeronautics and the opportunity which now presents itself of placing the industry upon a scientifically co-ordinated basis, as is the automobile industry.

## American Aviator Lost Leg in France

Theodore Marburg, Jr., second lieutenant in the Royal Flying Corps of the British Army, has lost a leg as the result of injuries received while on the firing line in France early in December. The amputation was performed on January 11 in a military hospital at St. Omar, just in the rear of the fighting lines.

## New Interests Paid Curtiss \$5,000,000 in Cash

Articles of incorporation of the Curtiss Aeroplane & Motor

Company, which were filed in Albany last week, completed the transfer of the Curtiss plants and business to the new company, and incidentally revealed in an official way the extent of the business that the genius and energy of Glenn H. Curtiss has developed.

The business was taken over by a syndicate headed by William Morris Imbrie & Co., of 61 Broadway. Mr. Curtiss receives for his interest in the business \$5,000,000 in cash, \$3,500,000 of the 7 per cent. cumulative preferred stock and 75,000 shares of common stock having no par value.

The authorized capitalization of the new company consists of \$3,000,000 serial 6 per cent. notes, \$6,000,000 7 per cent. cumulative preferred stock and 150,000 shares no-par value common stock. The notes will be dated January 1, 1916, and will mature as follows: \$1,000,000, January 1, 1917; \$1,000,000, April 1, 1917, and \$1,000,000 July 1, 1917.

The preferred stock of the company is preferred both as to assets and dividends and the dividends are to be cumulative at the rate of 7 per cent. After the payment of the notes a sinking fund of \$300,000 per year is to be established for the protection of the preferred stock. No dividend is to be paid on the common shares (as long as any of the preferred shares remain outstanding) greater than \$8 per share per annum unless the sinking fund shall have increased to a sum in excess of the stated amount. A majority of all shares will be in a voting trust of which Mr. Curtiss and a representative of the syndicate will be voting trustees.

The profits of the Curtiss Company for eleven months ending November 30, 1915, were \$1,786,412. The company has on its books orders from foreign governments for 1,050 machines, with extra parts, motors, etc. These orders are not subject to cancellation. There have already been delivered 250 machines included in these orders and the remaining business will amount to about \$13,000,000 and yield a profit of from \$6,000,000 to \$7,000,000. In addition to this the company has prospects for business from Russia, Spain, Italy, Norway, Sweden, China, Japan, South America and the United States.

In its discussion of the development of the industry the syndicate managers make this statement:

"The rapid progress in the perfection of the machine has caused models to become obsolete so rapidly that it has been necessary, and should be necessary for some time to come, for governments to replace their equipment of aeroplanes by new machines of more improved and later models. To illustrate: At the beginning of the war the advanced type of biplane carried a 90 h.p. motor. The latest model manufactured by the Curtiss Company has two engines of 160 h.p.

Hoisting aeroplane aboard destroyer at Pensacola, the method evolved by experts of the Navy Department.





each and the company is now developing a machine which will be driven by six of these engines and will receive the consequent increase in radius of action, speed and lifting power."

The directors of the new corporation are: Glenn H. Curtiss, Monroe Wheeler, Kenneth B. McDonald and Harry C. Genung, of Buffalo; G. Ray Hall, of Hammondsport, and James Imbrie, C. Horace Conner, Murray W. Dodge, George Q. Palmer and Harmon S. Graves, of New York.

Mr. Curtiss will continue the management of the company, his services having been secured for a long term of years.

#### The New Burgess Seaplane for the Government.

In addition to the seaplanes for the United States Navy now under construction at the plant of the Burgess Company, Marblehead, Mass., the company is making several aeroplanes for the militia of various states. The machines for Norman and Godfrey Cabot and George R. Fearing, who will place their services at the disposal of the Massachusetts Naval Reserve, are well under way in this plant.

Delegations representing the National Guards of Colorado, Illinois, Michigan and Rhode Island have also visited Marblehead for the purpose of securing aeroplanes.

School work has been greatly hampered since the first of the year by the unfavorable weather conditions, floating ice in the harbor making necessary great care in the use of the seaplanes. Despite these difficulties, however, a number of flights have been made in extremely cold weather by Aviator Clifford L. Webster. On January 13 preliminary tests of the new Navy war seaplanes were made. With a load of 300 pounds, in addition to the sixty gallons of gasoline and six gallons of oil, the big craft gave an excellent account of itself, easily exceeding its contract speed of eighty miles an hour.

The new seaplane, referred to in previous issues, is one of an order of three, which are nearly ready for shipment. The specified design calls for the fastest over-water machine ever constructed. The Burgess seaplane, however, goes further than this. It is by far the speediest aeroplane of its size ever turned out, either for land or marine work, having a surface area of nearly 500 square feet. In addition to this it is a heavy-weight carrier, tipping the scales at nearly a ton and a half—or 2,850 pounds, to be exact—when loaded, and weighing 1,900 pounds light. The total lift, therefore, exclusive of the machine itself, is just under half a ton. A climbing speed of 2,500 feet in ten minutes with full load on board is called for, the load including fuel and oil for four hours' flight, 380 pounds for pilot and observer, and a margin of 200 pounds for instruments and tools, extra fuel or explosives for offensive work.

#### Patriots' Ball To Purchase an Aeroplane

One of the most important social events of the winter will be the Patriotic Ball, to be held on the night of January 24 in the grand ballroom of the Hotel Biltmore, under the auspices of the National Organization of Women of 1915.

This society, organized several months ago, is raising a fund of \$10,000 to purchase an aeroplane for the New York Coast Defense, and this ball is the first of a series that is to be given with that object in view.

Mrs. S. D. Mosley, descendant of one of the oldest Knickerbocker families of patriots, is the president of the society, and is leading the movement in behalf of this praiseworthy object. Among those who will attend the ball are: Governor Charles S. Whitman and his staff, Mayor and Mrs. John Purroy Mitchel, most of the officers of the National Guard and the New York Coast Defence and Major General Leonard Wood. Mr. and Mrs. Clarence Mackay have taken a box, as have Mr. and Mrs. Edward B. Close.

The senior class of West Point has been invited and is expected to attend in full uniform.

#### Aeromarine Plane & Motor Co. News

John D. Cooper, of the Cooper Aircraft Co., of Bridgeport, Conn., has ordered two of the latest type direct six-cylinder vertical aeromarine motors which will be installed in a hydroaeroplane.

R. K. Jack, a prominent engine designer and builder, has accepted a position with the Aeromarine Co. as efficiency engineer and manager of the works at Avondale, N. J.

The Aeromarine six-cylinder vertical motor, which passed the British Admiralty test at Farnborough, England, has been sent to the French Government laboratories in Paris where the engineers in charge of military aeronautics will test it.

A new testing stand is being installed in the Aeromarine works so that motors of from 100 to 300 h.p. can be accurately tested, the present stand being too small to accommodate motors of high horsepower.

#### Stevens Institute Alumni Visit Sloane Manufacturing Co. Plant at Plainfield.

A party of some forty members of the Stevens Institute Alumni visited the plant of the Sloane Manufacturing Co., at Plainfield, New Jersey, on Saturday, January 15. Mr. John E. Sloane and Mr. Charles H. Day explained the principles of aeroplane construction to the visitors, and showed all of the parts of a tractor biplane under course of construction. The visitors also showed a great deal of interest in the Hall-Scott motors, which the Sloane Co. are installing in their planes.

In the evening the Alumni had their annual dinner in New York when they were addressed by Mr. Henry A. Wise Wood.



The sectional brazing room at the Niagara street plant of the Curtiss Co., Buffalo, N. Y.



## HIGH FLYERS OF AVIATION AND AIR OPTIMISTS



As the Evening World Comic Artist Saw Some of the Prominent Personalities Who Attended the Tenth Annual Banquet of the Aero Club of America

A. Santos-Dumont, the eminent aeronaut, was aptly designated at the Aero Club banquet as the first man who "went where he wanted to go," in the air.

Rear Admiral Robert E. Peary, discoverer of the North Pole, is now working to establish the first of the chain of aerial coast guard stations.

Glenn H. Curtiss, inventor of the flying boat, and head of the great Curtiss aeroplane industry.

Henry A. Wise Wood, vice-president of the club and president of the American Society of Aeronautic Engineers, whose vigorous campaign in behalf of adequate preparedness has attracted nation-wide attention.

President Alan R. Hawley's sphere of influence as the head of the Aero Club of America is unique, in that the club is developing, promoting and fostering both the national defense and aeronautical movements, the possibilities of which are beyond the range of imagination.

Hudson Maxim invented smokeless powder and "Maximite," the first explosive to penetrate armor plate.

Elmer Sperry the inventor of the gyroscope, the stabilizing apparatus for aeroplane, which is applied for the stabilization of both aeroplanes—the man about whom Admiral Fiske has said, "Sperry is the man who would lose his job if the earth should stop."

John Hays Hammond, Jr., of radio fame, has many achievements to his credit, among them a discovery by which torpedoes in the sea may be controlled from an aeroplane at a great altitude.

Dr. Alexander Graham Bell, the veteran inventor of the telephone and pioneer in aeronautics.

Henry Woodhouse, governor of the Aero Club of America and director of the American Society of Aeronautic Engineers, whose constructive influence on the affairs of the nation is tremendous.

James E. Clark, associate editor of Aerial Age, one of the men working in behalf of adequate national defense.



## NEW HOLDERS OF PILOT'S LICENSES



Some of the students of aviation who have been granted pilot's certificates by the Aero Club of America recently. Top row (from left to right): Murcel C. Dubuc, a Canadian, student at Stinson School of Aviation, qualified on Wright Model B machine; W. Roy Walker, American, student at Stinson Aviation School, qualified on Wright Model B machine; Edward A. Stinson, brother of Miss Katherine Stinson, qualified on Wright Model B; Steven W. Callaway, American, student of Griffith Aviation School, Los Angeles, qualified on Curtiss biplane equipped with Hall Scott motor. Second row (left to right): August Thiele, American, student at North Island School, California, qualified on Curtiss Model D; John A. Harmon, Canadian, student at Stinson School, qualified on Wright Model B; Arthur C. Burns, American, student at North Island School, qualified on Curtiss Model D; Joseph Gorman, Canadian, student of Stinson School, qualified on Wright Model B. Bottom row (left to right): Herbert Mackenzie, Canadian, student at Stinson School, qualified on Wright Model B; Olokichi Shibaki, Japanese, student of Griffith School, qualified on Curtiss Model D; George H. Witts, British, student at North Island School, qualified on Curtiss biplane; A. J. Croft, British, student at North Island, qualified on Curtiss biplane.

### The United States Has No Anti-Aircraft Guns

Admiral Frank Fletcher, in his report to the Navy Department officially lays before the government a warning of a national danger. He declares that the large Atlantic seaports of the United States would in the event of war be virtually at the mercy of an invading aerial fleet because of the total lack of anti-aircraft guns.

He points out that the present war has developed the anti-aircraft guns as an efficient means of combating the aeroplane, and he strongly recommends immediate action to remedy this defect in the nation's defenses.

### Admiral Peary Favors Swiss System

"In all of the mass of talk and suggestions in regard to preparedness," said Rear Admiral Robert E. Peary at the tenth annual dinner of the Explorers' Club, held in Hotel McAlpin, New York City, "there are two definite, practical

national defense propositions which appeal to me very strongly. One is the aerial coast guard system, the first station of which is soon to be established in Portland, Me. The other is the adoption by the individual states of the Swiss system of citizen military education and training."

With such a system as the Swiss have, Admiral Peary asserted, New York State alone could place 1,000,000 trained soldiers in the field within forty-eight hours. The Admiral declared, too, that at the close of the present war there will be a world-wide struggle in efficiency—industrially and commercially—and that the United States will be far behind unless we commence a system of military training which will increase the nation's possibilities.

### Benoist Flying Boat Agency in London

Frank Morris, of 54-55 Piccadilly, London, has been appointed agent for the Benoist Flying Boats, which are favorably known in London.



## JOHN HAYS HAMMOND, Jr., TO USE AEROPLANES

THE Navy Department has asked Congress to appropriate nearly \$1,000,000 for the purchase of the rights on the Hammond patents and plans for the radio-controlled torpedo.

The plans evolved by Mr. John Hays Hammond, Jr., provide for the use of aeroplanes as the radio stations from which to control coast defense torpedos. By employing aeroplanes the effectiveness of the wireless controlled torpedo can be extended greatly. It makes it possible, in fact, to guide the torpedo far out at sea, where it could not go otherwise.

A dispatch from Washington quotes naval officers as follows:

"Aeroplane control makes it possible for the operator to guide the radio torpedo through the water from any height, air bubbles from the compressed air motor of the torpedo giving him a certain guide by which to steer it against a ship's hull. By use of powerful glasses it has been possible heretofore to control the torpedo from shore to a distance of nearly 10,000 yards, but the aeroplane device now will make

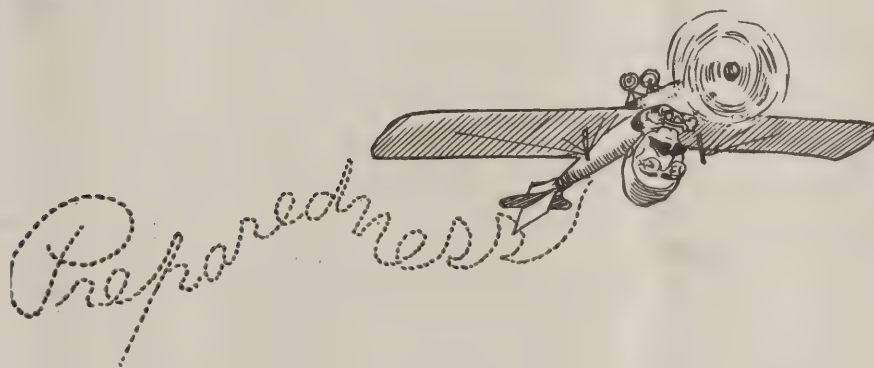
the missile effective to the full range of its motor capacity, or even far at sea, if the torpedo is launched from a swift motor boat within sight of an enemy ship."

Mr. Hammond has just returned from a trip to Europe, where he went to look over the field and see the latest developments in naval aeronautics. Owing to his prominence he was admitted in the inner naval circles wherever he went and gathered a lot of important information regarding the application of aeroplanes for naval purposes.

Mr. Hammond has been a pioneer in naval aeronautic experimentation. Even before aeroplanes were used for warfare he considered their application for naval purposes and for aerial warfare. In recognition of his work President Taft in 1912 appointed him member of the Advisory Committee on Aerodynamics. His fame as an inventor is world-wide and there are over one hundred important patents in his name.

The adoption of aeroplanes in connection with the Hammond radio controlled torpedo will bring scores of aeroplanes into use for coast defense.

## TWIN SIX ENGINES FOR AEROPLANES



I HAVE recently ridden in one of the best American aeroplanes, studying the application of an aeroplane motor to the wants of aircraft. Some of our directors have done considerable aeroplane riding and know the serious needs of the aeroplane art for the very best motors which can be produced.

It is probably a little out of the ordinary for a corporation to go out of its way to produce such military devices as aeroplane motors, because the demand for them probably will be very uncertain. Yet our directors feel that it is a part of the very important duty of manufacturers in this country to mobilize their facilities into such form as that they might be availed of in time of need.

I feel that I have understated the proposition as to the views which our directors hold of the duties of manufacturers in this country to work in co-operation with the government officials so that we may be ready for any contingency. Our company believes that it is its duty to carry on this work

towards the condition of military preparedness which all our directors thoroughly believe is the important necessity of the day.

This is not because we are of a warlike disposition. But three out of seven directors of the Packard Company have served in the United States army or navy in time of war, and two others have served long tours of duty in the Michigan State troops. It is not therefore unnatural that our company realizes, probably to a greater extent than the average manufacturer, the very serious distress which would exist in time of trouble for want of equipment being available on sudden call to meet the conditions of war which always occurs with surprising suddenness.

At present we are seeking to develop aeroplane motors in the neighborhood of 100 horsepower and 200 horsepower for light scout aeroplanes and heavier duty aeroplanes.

HENRY B. JOY.



# AEROPLANE WINGS

Based on Experiments of Gustave Eiffel

By NEIL MAC COULL, M. E.

IN the present state of the knowledge of aerodynamics, the characteristics of aeroplane wings, propellers, etc., can not be determined except from experimental data. Fortunately there is sufficient data taken from model experiments and checked by full sized parts to make it quite possible and not very difficult to design a complete aeroplane of which all the aerodynamic characteristics are known before it is constructed.

In Figs. 1 and 3 are given the dimensions of twelve wings tested by M. Eiffel, many of which are used on well-known aeroplanes. Dimensions are in millimeters, but that is no handicap to those who are not familiar with the metric system, for it is the *relative* dimensions only which are of importance when laying out a larger wing. For example, suppose one of the model wings tested had a chord of six inches, then all the other dimensions of that wing would have to be multiplied by some number so that the chord would be the size desired for the full sized aeroplane. Assume that it is desired to lay out wing No. 36 with a 66-inch chord. From Fig. 1 it is found that the chord of the model is 159. Then all dimensions of the model must be multiplied by  $\frac{66}{159}$ , or 0.415. When the points determined in this way are laid out full size it will probably be found that it is not possible to draw a smooth curve exactly through all of them on account of small errors which may have crept in somewhere between obtaining the measurements of the actual model and laying them out. However, it will be sufficiently accurate if the curve is drawn in as near the points as possible, giving due regard to the general shape as shown in the figure, for these curves have been drawn to scale.

## MONOPLANES

In Fig. 2 are given curves drawn from M. Eiffel's data, showing the lifts and drags\* of these wings. It is somewhat confusing at first glance to see so many curves superimposed, but this has been done because of the value of an exact comparison between different wings. With a little care the curve for any wing can be traced out, since each curve is numbered at both ends with the number of the wing which it represents. Either the lift or drag of geometrically similar wings may be determined at any point on these curves by multiplying the coefficient corresponding to this point by the area of wing in square feet, and the square of the velocity in miles per hour, thus:

$$\text{Lift (lbs.)} = (\text{Area}) \times (\text{Lift coefficient}) \times (\text{m.p.h.})^2 \dots (1)$$

Angles of incidence with the wind are given at intervals of three degrees (except for No. 12), but it is not necessary to determine these angles very accurately, as will be shown later.

All of these wings, except No. 33A, had an aspect ratio of about six, the span of each being 35.4 inches and the chord of most of them 5.9 inches. The corners were square. Rounding the corners as is frequently done has but little effect on the coefficients, though there is a slight reduction of drag when the leading edge is a little shorter than the rear edge.

Wings Nos. 1 and 12 were tested at velocities of about 22 miles per hour, while the others were tested at about 55. Now the accuracy with which these results can be applied to full size aeroplanes depends on the constancy of the lift and drag coefficients with: size of wing, aspect ratio and velocity. In a general way experiments have shown the following, though it must be remembered that no single set of rules can be made to apply to all wings with equal accuracy.

**Size of Wing.**—M. Maurain, at Saint-Cyr, has tested some large wings by mounting them on an electric carriage, and running them through still air. The results seemed at first to show a higher lift, with nearly the same drag, as geometrically simi-

lar wings tested by M. Eiffel. Later it was found that the electric carriage had an effect on the results, and by making corrections determined by M. Eiffel from tests he made with a model of this carriage, the characteristics of these different sized wings were found to be practically identical.

Commandant Dorand was able to make quite accurate measurements with a full size aeroplane while in actual flight in still air. The average error in results when compared with a 1/14.5 scale model of the same aeroplane as tested by Eiffel at the same speeds, was only 1 per cent, proving quite satisfactorily that the lift and drag coefficients are independent of size.

**Aspect Ratio.**—Wing No. 33A was made identical with No. 33 except that it had an aspect ratio only one-half as great. The result can be seen by comparing the curves of Fig. 2. It will be noticed that at small angles of incidence the difference between the curves is not so great as at larger angles. It has also been found that while both lift and drag are improved by increasing the aspect ratio, still there is not much gain in going above six, or eight at the most. High aspect ratios bring in structural difficulties on account of the small depth for wing spars and inconveniently great span. G. C. Loening in his "Military Aeroplanes" recommends the following table for approximate corrections to be made for different aspect ratios. The lift and ratio of lift to drag, taken from Fig. 2, are to be multiplied by the proper values taken from this table. It will be seen that there is no correction to be made for a ratio of six, as that is the ratio on which Fig. 2 is based.

TABLE I—CORRECTION FOR ASPECT RATIO.

Aspect Ratio.	Angles of Incidence.					
	3°		6°		9°	
	Lift.	$\frac{\text{Lift.}}{\text{Drag.}}$	Lift.	$\frac{\text{Lift.}}{\text{Drag.}}$	Lift.	$\frac{\text{Lift.}}{\text{Drag.}}$
2	.60	.47	.62	.54	.60	.55
3	.70	.58	.73	.64	.78	.72
4	.84	.73	.85	.77	.90	.83
5	.94	.86	.95	.90	.96	.92
6	1.00	1.00	1.00	1.00	1.00	1.00
7	1.05	1.06	1.04	1.10	1.04	1.09
8	1.08	1.09	1.08	1.16	1.08	1.15

**Velocity.**—Early experiments made in velocities up to about 40 miles per hour led to the conclusion that the characteristics of most wings were independent of their velocity. Later tests, including velocities up to 89 miles per hour, show that some wings have decreasing coefficients of drag as the velocity is increased, though the lift coefficients showed no change. This is particularly true of wings with a reversed curvature, such as No. 32. At one-third the velocity (67 m. p. hr.), at which the characteristic curve in Fig. 2 was plotted for this wing, the drag at 0° was more than twice as great, the difference diminishing at increasing angles until there was almost no difference at 15°. The lift coefficient was independent of these velocities. And yet both lift and drag coefficients of another wing, though of single curvature, varied less than 3 per cent. between velocities of 22 and 89 miles per hour.

Experiments with some models of complete aeroplanes show appreciable increases of lift coefficients with increasing velocities, though the drag coefficients are very slightly decreased at small angles, and not greatly increased at large angles. The whole question of velocity is too uncertain at present to make but one general conclusion: when the coefficients are not constant, flying conditions are apparently improved as the velocity increases. It is hoped that more exhaustive experiments will be made in regard to the effects of velocity variations in the near future. For the present it is well to consider the coefficients as constant for all velocities, as there will not be much difference in most cases, and what difference results may be considered as a sort of "factor of safety" to assure obtaining calculated results when an aeroplane is constructed.

(To be continued)

\* The term "drag" is used in preference to the usual "drift" in order to prevent confusion with the more correct use of the latter word in connection with the deviation of an aeroplane from its apparent line of flight due to side winds.



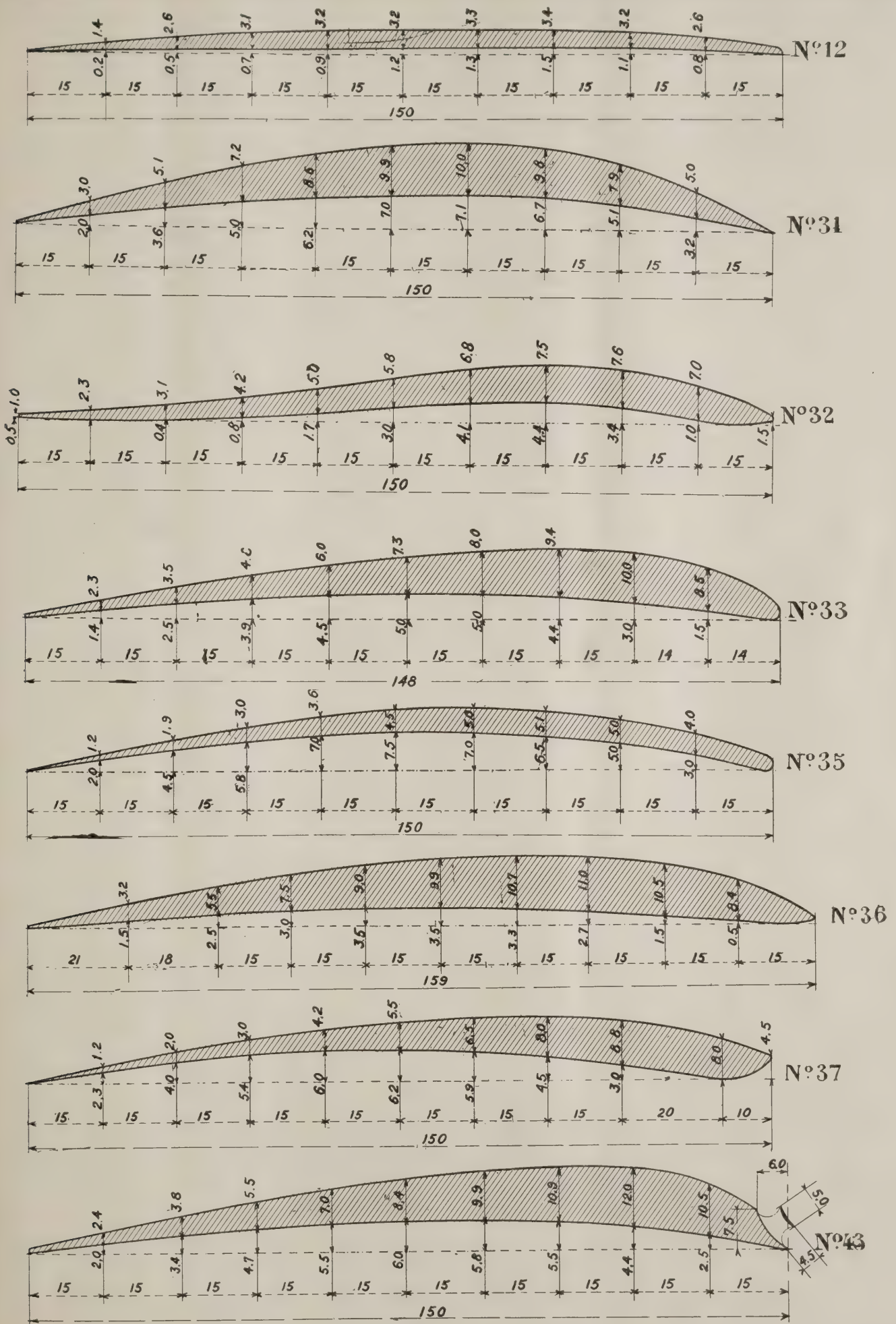


Fig. 1





# FOREIGN NEWS

By JAMES E. CLARK



## AUSTRIA

An Italian aeroplane has dropped bombs on Laibach, but no one was injured and no damage was caused. Enemy aviators last week threw bombs on Roncone without doing any damage.

## BULGARIA

A squadron of French aviators on Tuesday bombarded the first line of Bulgarian trenches in the Strumitza sector, wrecking several trenches and killing and wounding many soldiers, says a dispatch from Athens to the Exchange Telegraph Company.

A flotilla of French aeroplanes last week dropped bombs on Sofia, causing considerable damage and an indescribable panic among the inhabitants of the Bulgarian capital.

## FRANCE

"Twelve of the French pilots," says a belated account in the Paris *Matin*, "decided to follow the German Army in the retreat from Nish to Kraliero and then through Prishtina to Prizrend. They repaired their machines at night with old pieces of cloth and piano wires. They used their petrol to the last litre, without saying a word to the Serbian General Staff. They suffered hunger without complaining. Two of them, one a very popular pilot and the other an officer, anxious to give important and accurate news to the Allies, flew from Prizrend to Avlona, flying through a pass not more than 600 feet broad in the Drin Valley, despite a thick fog. Finally, after having crossed the mountains, they landed at Avlona before the astonished Italians, who gave them an enthusiastic reception. There only remained in their tanks enough petrol to allow them to fly for two more minutes."

A monthly meeting of the chiefs of the Anglo-French aviation forces will be held in Paris in the future. Representatives of all the Allies will attend for the purpose of obtaining greater unity. The development of the Russian air corps has been arranged for by an exchange of men, the French to go to Russia as instructors and Russians to go to France for instruction in the French service.

France has supplied one-fifth of the Allies' output of aeroplanes and one-third of their output of motors since the beginning of the war, according to the *Matin's* figures.

French aircraft have made an attack on Monastir and returned safely to their base, reporting that they saw many fires in the town as a result of the bombs which they had dropped.

On January 14 enemy aeroplanes dropped projectiles on Janes (Yanesh), northwest of Kukus (Kilkich), and on Doganizi. A few Greek soldiers were wounded and one was killed.

## GREAT BRITAIN

A representative of the United States Embassy at Berlin recently visited British prisoners at Munich and Ingolstadt. At the latter place he saw the following aviators: Squadron Commander E. Briggs, R. N. A. S.; Lieut. E. R. C. Scholefield, R. F. C.; Capt. J. F. C. Wilson, Scottish Rifles, attached to R. F. C., all of whom were in Fort IX; and in Fort X he saw Second Lieut. W. M. Crabbie, the only British officer in that place of confinement.

A German naval expert says that the failure of the measures adopted to defend London against aerial attacks is another striking proof that the British are lacking in organizing ability. The responsible authorities, he says, do not provide enough aircraft for the protection of the city, and the airmen to whom the machines are entrusted are not disposed to carry out their task with energy and a conscientious desire to do their duty.

The London Daily Mail draws attention to German announcements that ten British aeroplanes have been downed and eight airmen killed on the western front in the past month, and asks what the reason is. In this connection it speculates on whether the new battle plane, known as the Fokker, described in *Aerial Age*, with a reputed speed of 112 miles an hour and the ability to climb 8,000 feet in ten minutes, is establishing its superiority.

It remarks further on the possibility of daytime aeroplane raids on England, such as the French and British have instituted at times against Germany, and wonders whether the Government is prepared for such a contingency. Gunfire, it contends, is practically useless, the only method of combatting an aeroplane raid of the kind being with swifter and more heavily armed planes than the enemy's.

Squadron Commander Billing has resigned his commission and is a candidate for election to the House of Commons on an "air-raid defense" ticket. In a public communication he says he resigned his commission in the naval air service for the purpose of advocating more efficient defense of London against impending air raids. The writer asserts that the Germans are actively preparing for a raid on a most extensive death-dealing scale, compared with which all the previous raids were child's play.

"Contrary to the general belief," he says, "it is not Zeppelins alone that this country will have to meet. Germany is completing large numbers of bomb-dropping aeroplanes capable of carrying big loads of missiles enormous distances. These obviously are intended to be used against England, and probably against London."

Mr. Billing asks: "Has the Government taken steps to meet this peril?" and answers his question by saying: "The aerial defense of London has been neglected from the outset."

"Three Zeppelins, to my knowledge, were destroyed in December by the British defenders. One of the big dirigibles was brought down by shots from a warship anchored in an English harbor. The other two were destroyed by British aeroplanes. The general opinion among military men in England is that London is now virtually safe from further Zeppelin raids."

"Nevertheless the British have taken elaborate precautions to guard against the consequences of a possible raid. The actual damage which might be caused by bombs from Zeppelins is not feared nearly so much as the possibility of a general conflagration. To prevent this the London Fire Department has been brought to a high state of efficiency, and in addition volunteer fire companies have been organized in all of the suburbs."

A statistician has discovered that more people are killed in London on account of the darkness than as a result of Zeppelin raids. A total of 121 persons have been killed by vehicles in the streets since October alone, while the total number of those killed by German bombs is only 102, this being the total for the three Zeppelin raids on September 7 and 8 and October 13. Taking away the numbers killed by Zeppelin bombs on September 7 and 8, those killed during the weeks the darkening order has been in force number exactly half that of people killed by omnibuses, tramway cars, cabs, cars and other vehicles.

Put briefly, the results of lighting and darkening the streets are: Number killed—October 11 to November 20, 1913, 59; October 10 to November 21, 1914, 85; October 11 to November 22, 1915, 121.

Dr. W. H. Vincent, of the Colonial Medical Corps, who arrived in New York a few days ago from London, says that the latter city is now virtually safe from attacks by Zeppelins. "The real reason why Zeppelins have not been able to bombard London or its suburbs since October 14 last," said Dr. Vincent, "is because the British have established an elaborate and efficient defence against the German air raiders. During the month of December there were twelve separate attempts by Zeppelins to reach London. From two to four Zeppelins participated in each attempt. In the month of November there were several other attempts. But in no case were the German dirigibles able to reach even the outskirts of London."

The War Office last week made the following laconic announcement: "Four of our aeroplanes sent out yesterday have not returned."

## GERMANY

In recognition of their accomplishments in shooting down a British aeroplane each the Kaiser has decorated Lieutenants Boelke and Immelmann with the Order Pour le Merite. One of the aeroplanes was brought down northeast of Touroing and the other near Bapaume. A third British aeroplane was shot down in an aerial fight near Roubaix, and a fourth was brought down by defense guns near Ligny, northwest of Lille. Of the eight British officers on board the four aeroplanes six were killed and two wounded.

On the western front an enemy aeroplane was shot down by Lieutenant Boelke. It fell into the British lines and was shelled into flames by German artillery.

## GREECE

A squadron of twelve German airships bombarded Saloniki last week, dropping no less than 75 bombs and inflicting severe damage on the camps of the English and the French. Their marksmanship was generally accurate, twenty hits being scored. Several of these caused outbreaks of fire. The attack was so sudden that it came in the nature of a surprise, and the Allied airships did not rise in time to repel the invaders. Two of the German aeroplane men, however, were brought down by the Allies' anti-aircraft guns. The rest of the squadron returned to their headquarters in safety.

## ITALY

Italian aviators threw bombs on Roncone, but the German War Office reports that the missiles were ineffective.

On both sides there has been great aerial activity during the last week. One of our air squadrons made a raid on Gandolo, north of Trent, and bombarded the enemy's aviation field there. On the way back the squadron dropped bombs on the railway station at Trent and the Rovereto Barracks, near Volono, and afterward returned safely to our lines.

Enemy aviators threw bombs on several places in the Isonzo Plain without doing any damage.

On the upper and middle Isonzo the enemy batteries tried to hit the Italian lines with the aid of aeroplanes. They were effectively countered by the Italian artillery. Italian aircraft guns compelled the aeroplanes to remain at a great height.

One of four Austrian aeroplanes which attacked Rimini was brought down by the combined fire of shore batteries and the guns of warships and was sunk in the Adriatic.

An Italian aeroplane dropped bombs on the barracks in the Breguzzo zone, in the Valley of the Giudicaria, and returned unharmed to its base.

## RUSSIA

The intense cold in Russia has greatly interfered with the German scouting service. "For a long time," says a correspondent, "the Germans have relied upon their double nationality spies resident in the country, with whom communications were kept up, as a last resort, by aeroplanes. Nowadays the Russians make a clean sweep of untrustworthy persons within the zone of military operations, and German aeroplanes can not safely continue their expeditions. The cold rapidly increases with every few yards of altitude, and as the aeroplanes rush swiftly through the air at a temperature of from 50 to 70 degrees below Fahrenheit freezing point, no known methods will keep the pilot and observer from death by cold. Therefore the German pilots now fly at much lower altitudes, and even then without always escaping the worst effects of the intense cold. The Russians now bring them down at the rate of several daily, chiefly with rifle shots. Captive balloon observation points fare little better, as they make excellent targets in the clear, frosty air. One was brought down on the Dvinsk front by artillery, which continued to bombard the place where it fell, and before long a tremendous explosion took place. Evidently a shell hit the stores of gas for the balloon."

## TURKEY

Lieutenant Boedecke, of the German Aero Corps, on January 12, on the Turkish front, shot down his fifth aeroplane, a British machine of the Farman type. One of the aviators was killed and the other wounded. After being repaired the aeroplane will be used by the Turks. Another British aviator was forced to land.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
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**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### How To Construct and Fly Model Aeroplanes

By G. A. CAVANAGH

#### Handling the Model

In the last issue the assembling of the different parts of the model were considered, and now with the model ready for flight the proper method of handling it will be described. The handling of a model is just as important as the making, for no matter how well constructed or efficient a model may be the result will be anything but satisfactory if it is not handled properly upon the field.

The first thing to do before winding up the rubbers is to see that the model is properly balanced, and this may be done in the following manner: Cast the model lightly from the hand with the rubber strands hanging loose and unwound. If it dives down, point first, move the main wing slightly forward, and if it continues to dive after the second attempt, move it a little further. If, however, it rises abruptly, move the main wing slightly toward the rear. Keep moving it slightly forward or backward, as the case may require, until it glides away and lands flat upon the ground. Now the model may circle to the right. In this case move the main wing slightly to the right. Should it circle to the left, move the wing slightly to the left. The wing should be moved slightly to the right or left until the model glides straight ahead. When this has been done, the model will be properly balanced and is now ready to fly.

To wind up the rubbers it is necessary that some one hold the model at the rear. However, be sure that the model is held properly, for, if it is not, the outstretched rubbers will have a tendency to bend the propeller shafts. The person holding the model should grasp the rear end of the frame, so that the thumb is on top and the four fingers underneath tightly grasping the main sticks of the frame. The propellers, of course, should not revolve. Next detach the hooks that are on the rubbers at the point of the model and attach them to the hooks on the winder. The winder is easily made from an egg-beater, or may be purchased at a nominal price. Stretch out the rubbers until they are about four times their length; start to wind, and walk in slowly as the rubber is being wound. If the ratio of the winder is five to one, or five turns to revolution of the main wheel, 100 turns will be sufficient for the first trial. More can be given after a few trials have been made. When the rubber has been sufficiently wound, detach the hooks and attach them to the hooks on the model. Hold the model above the head, one hand in the center of the frame, the other in the center of the cross-piece at the rear, and in such a way that the propellers will not revolve. Cast the model into the air; if it is properly adjusted, the model will fly straight ahead. To make good flights a little experience is necessary. After this model has been made to fly satisfactorily, the builder will no doubt want to see it rise from the ground. In order to do this, however, it will be necessary to make a chassis which may be attached to the model. This will be described in a subsequent issue.

### The Aero Science Club of America

Many subjects of interest were discussed at the meeting on January 15th. Mr. George Weaver, of the I. M. A. C., was present and spoke to the members about the experiences which both he and Mr. Emil Laird, of the same club, went through while they were filling exhibition dates during the past year. Mr. Weaver told of the many incidents that happened from the time they started out until they had completed their schedule. He also spoke of the progress of the I. M. A. C. Mr. Gordon Hood, of Toronto, Canada, who also traveled from place to place with various aviators to fill engagements, told of a number of interesting incidents which occurred while they were traveling about. A general discussion followed concerning compressed air motors. Mr. Tismer, who has had considerable experience with various types of motors, explained to the members how the present type of compressed air motors could be improved upon. Mr. MacMahon was present with a number of compressed air motors, one of which embodied a number of new and interesting features. Mr. Schober also exhibited a compressed air-driven model, the workings of which he demonstrated for the benefit of the members. As soon as permission is obtained, allowing the members to use one of the armories, both these members will give indoor exhibitions. Mr. Cavanagh represented the club at the Y. M. C. A., Orange, N. J., Thursday, January 13, and reported that a number of interested young men were present and that officers would be elected at the next meeting. The members voted to issue a year-book. This will be taken care of by Mr. Schultz and Mr. Cavanagh.

For further particulars address the Secretary, 29 West Thirty-ninth street, New York City.

### Illinois Model Aero Club

By ARTHUR E. NEALY.

At the last meeting of the I. M. A. C. Mr. Brock, who won three of the most important European aerial derbies, spoke to the club on his experiences. His talk was exceedingly in-

(Continued on page 458)



To the left, the proper method of launching a model; to the right the method of holding the propellers prior to launching. Both boys are members of the Concord Model Aero Club, Morison Blake (left) and Lloyd Kenny (right).





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### No Luck

Aviator—I wish that nature had made me a woman.  
She—Maybe she has, but you haven't found her yet.—  
*Princeton Tiger.*

#### Social Uplift

I'm asking a raise—said my pretty stenog—  
For I'm planning a regular spree.  
Very well—was my answer—I'm never a hog,  
And I raised her—right up to my knee.  
*Williams Purple Cow.*

#### At the Banquet

Slam—Some dress suit, that. Is it yours?  
Bang—Yes. The B. V. D.'s are.

#### Sum Girls

"A group of pretty girls in bathing suits are a pretty set of figures."  
"Yes, they add much to the pleasantness of the scenery."  
"And subtract from its monotony."  
"Not only that; they multiply the interest of the day."  
"And divide our incomes."  
"You win."

#### Locomotor Atalksia

First Clubman (peevish like)—What did you get Dry-bones started on that subject for?  
Second Loafer—Started, hell! He's such a crank he starts himself!

#### In the Golden Age of Flying

Some of our readers do not know that during the golden age of exhibition flying, about five years ago, when a modest exhibition flight brought a small fortune, aviators were troubled with an excess of wealth, and some found it hard to spend it fast enough. An aviator actually tried a champagne bath, which took hundreds of quart bottles of the best joy water.

At about that time the wives of aviators wore some of the largest and most beautiful pearls and diamonds. One day, it is said, either J. C. Mars, Frank T. Coffyn, Walter Brook-ins—or was it somebody else?—was out for a flight with his better half when she nudged him and asked him to land. "I have lost my pearl," she said, pointing down to something.

He looked down and shook his head. "You are mistaken, dearie; that's Lake Erie," he said.

#### English Spoken

American Aviator—Parlez-vous Anglais?  
The Parisienne—Oui, un peu—kees me queeck! Do you lofe me? 'Old me tight! Damn! 'Ell!—*Puck.*

"Have you been gyming, Bertie?"  
"Yeth; and getting stwong. Cawn't woll a cigawette now without bweaking the papah."

Aviator-General: I want to get the most powerful pair of binoculars you have.

Optician: Here you are, sir. Made in Germany. With these glasses you can even see the United States Army.



Takes a man with an inventive brain to appreciate aeroplane exhibitions.

Courtesy Goldberg, Evening Mail.



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## AEROPLANES

In the scientific perfection and thoroughness with which they are designed, constructed and tested in flight, Sturtevant Aeroplanes inaugurate a new era in Aviation.

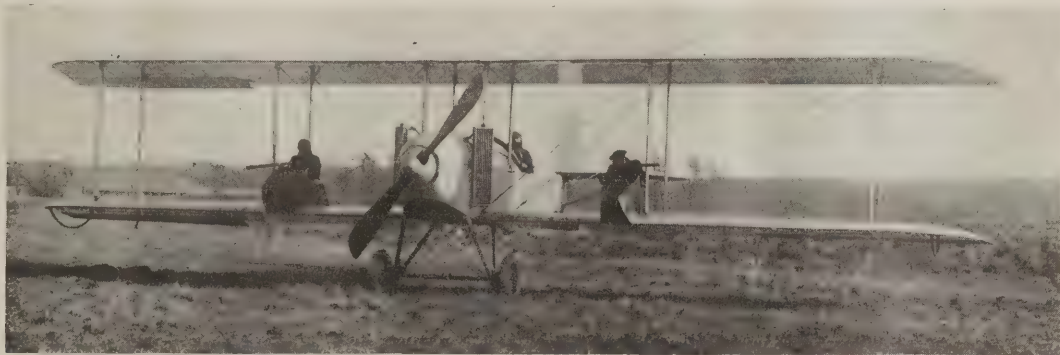
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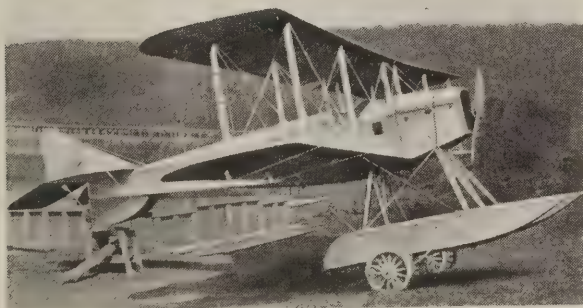
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# PROOF

## WESTERN UNION CABLEGRAM

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STURTEVANT Aeroplane Motors are flying daily in Europe and America. They are delivering their full horse-power and are giving dependable service under all conditions.

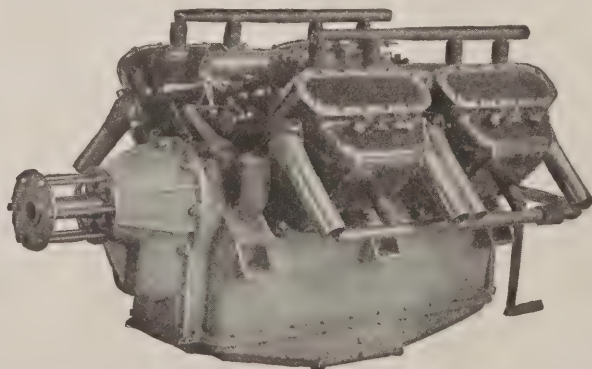
Sturtevant Aeroplane Motors are built from crank-case to piston rings in one factory, a factory of unlimited resources with 25 acres of floor space and one of the finest equipments in America.

The Sturtevant Aeroplane Motor Department of the B. F. Sturtevant Company is in charge of aeroplane motor specialists, men who have devoted the past five years to designing and building aeroplane motors alone. Every Sturtevant Motor is built under the direct supervision of these specialists.

This Department is always at the service of purchasers. You are invited to inspect these motors in process of construction at our Works.

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And All Principal Cities of the World

### Thomas News

Arrangements have been made with Mr. C. Ray Benedict to operate a branch of the Thomas School at St. Augustine, Fla., for a period of four months. The assistance of another well-known aviator, Mr. Earle Dougherty, has been secured and with this combination and the ideal weather conditions of the South, the progress of the students will be very rapid.

Among the students at present enrolled for training at St. Augustine are: W. G. Peck, G. W. Peck, Alfred D. Pelton, Allen Wilson, of Montreal; R. M. Kierstead, of Toronto; J. D. Probst, of Englewood, N. J.; P. N. Montague, of Winston-Salem, N. C., and Theodore Kruiff, of New York City.

St. Augustine is a city with many interesting points, and it offers a student an ideal place for training. It is doubtful if there is any other training school in the country where the art of flying can be acquired under such happy conditions. At every turn is an historic building, street or relic of some kind. St. Augustine enjoys the distinction of being the oldest city in the United States, and it is endowed with quaint charm, antiquity and splendor, Nature's choicest treasures. The historic relics of Spanish days are encountered at every turn.

Though the glamor of romance still clings to St. Augustine, the city is modern in all that tends to make life pleasant. Accommodations have been secured for the students near the training ground for \$5 per week, which includes room and board. Every class of accommodation can be found in this city, and a student can suit his own purse.

The United States Naval Aeronautical Station at Pensacola will be an added attraction for students, who are taking training for military service. Almost every day the officers flying the machines are making long trips across country, out to sea, traveling by compass.

The report that Secretary Daniels will submit to Congress a plan for the creation of an Aviation Corps for the Navy by appointing aviators from civil life, without requiring them to pass through the Naval Academy, has resulted in many inquiries regarding the Thomas School and its methods of instruction.

The class for the spring term, which begins in April, is now forming for the school located in Ithaca, and several applications have been received. The school will open there with about six machines, three instructors, and with not over ten men to a machine.

### Illinois Model Aero Club

(Continued from page 455)

teresting and was sprinkled throughout with amusing incidents that had come to him while flying in England and on the continent. Mr. Brock took a lively interest in the club and at the close of the meeting was unanimously voted an honorary member.

The special speakers' meeting on the 28th of this month will probably have to be postponed. Mr. Stout, of Detroit, will be unable to get here on that date, and one of the Chicago aviators who was to have spoken also will be out of the city at the time.

Mr. Emil Laird, former president of the club and now an expert aciator, together with Mr. George Weaver, of the Cloan Company, also a member of the club, have recently donated the I. M. A. C. a huge silver cup to be competed for by members. The club expresses its thanks to "Buck" and "Matty."

### Milwaukee Model Aero Club

BY GILBERT M. COUNSELL

At the last meeting of the M. M. A. C., the Club reviewed the meets of the year 1915. The Club opened its season with the contests for the books donated by the A. S. C. The winners were Clarence Bates, Erwin Eiring and Lynn Davies. The next meet was an R. O. G. Contest for a trophy donated by the Club. Erwin Eiring won this trophy after a very exciting contest. Then followed the meet with the Illinois Model Aero Club at Chicago, the Illinois Club winning two-day meet by a small margin. In September the I. M. A. C. came to Milwaukee for contests at the Wisconsin State Fair. Several cups were awarded the winners. The Club entered in the National Hand-Launched Duration Contest, but failed to enter in the R. O. G. and Hydro contests. The Club's showing for the past year rests upon the work done by the following members: Lynn Davies, Erwin Eiring, Clarence Bates, Kenneth Sedgwick, Alfred Hayden and Gilbert Counsell.

The Club is preparing tractors for the Phillip Trophy donated by Mr. and Mrs. Dyer, honorary members of the Club.

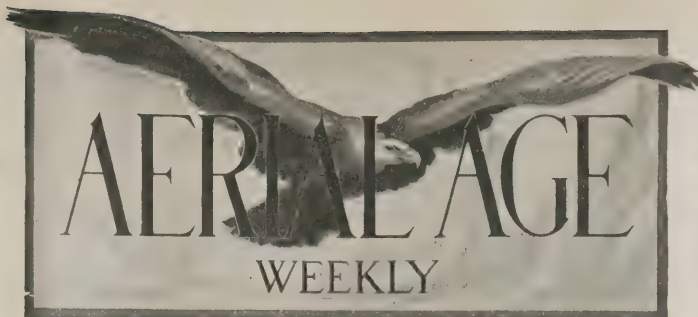


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VOL. II.

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No. 20

### Army and Navy Department and Geodetic Survey Asked to Co-operate with Aero Club of America in Securing Aerial Coast Patrol

TO advance the project of establishing an aerial coast patrol on the Atlantic and Pacific coasts and on the Great Lakes, the executive board of the Aero Club of America has written to Secretary Garrison and Secretary Daniels, and to Mr. E. Lester Jones, superintendent of the United States Coast and Geodetic Survey, inviting the co-operation of the Army and Navy Departments and the U. S. Coast and Geodetic Survey; and has authorized Rear Admiral Robert E. Peary, the father of the project, to organize a committee of Army, Naval and Militia authorities, and aeronautical and wireless experts from every part of the country, who will co-operate in establishing the chain of aerial coast defense units. The plan is to divide our entire coast lines into sections of convenient length, say about one hundred miles, and in each of these sections establish a station where would be erected a suitable hangar for housing a seaplane and an equipment sufficient to make all minor repairs, with several larger stations at intervals where all more complicated repairs can be made or a complete overhauling given at regular intervals.

Each of these sections and stations would be equipped with a seaplane. Each of these machines would carry a driver and an observer and be equipped with light wireless apparatus, powerful glasses and a sensitive microphone.

When in active operation these seaplanes in each section would take their position some fifty miles off shore, and patrol their respective beats continuously back and forth. In clear weather two thousand feet or more above the sea, from which altitude ships fifty miles distant may be seen. At night or in fog seaplanes would of course sweep much lower, at all times themselves invisible to an enemy.

By means of the wireless, information as to the character, number and apparent destination of approaching ship or ships would be transmitted to the shore station, and from these to Washington, whence, if the ships were hostile, orders would issue directing the movements of our fleet and the submarine squadrons for the preparation of the coast defenses and for the concentration of troops, if necessary, while reserve planes, hurrying out, would keep the approaching craft under continuous inspection while themselves invisible.

Such a system is a new departure. The like of it exists nowhere at present, and yet it involves no new principle, but is simply the utilization and multiplication of the known capabilities of a single seaplane.

A great attraction of the system is that its value as a peace asset is fully worth its cost even if we never have occasion to use it as a military asset.

It should be, under such circumstances, a natural and valuable adjunct of the coast guard and life-saving service. The partly submerged derelict, too light to sink and a constant menace to traffic, would be spotted by the aerial scout, and its presence reported. Wrecks, vessels in distress and all other marine incidents and accidents would be reported and aid quickly summoned when necessary.

Constant exercise, drill and training in these lines will make the system an invaluable school for keeping personnel and material tuned up to high efficiency, and cannot fail to have important results in improving and perfecting our seaplanes.

But if ever war should arise, the first value of this coast patrol service would be the prompt report, "Ready and

equipped for service," from a hundred or more trained flyers and observers, from mechanics and helpers organized into a state of military readiness.

In war times the patrol could weave such a continuous off-shore curtain of observance around our entire coasts as would make surprise attack in force an impossibility. The chance of a scoutship, a destroyer, or a cruiser escaping observation would be exceedingly small; and even a submarine, although submerged, might not escape the eye of the sea eagle soaring above it.

The present idea of the system is that the patriotic citizens of our coast communities shall furnish the funds for the equipment of the stations of the system, and that the upkeep and maintenance of these stations will devolve upon the Naval Militia of the coastal states.

Later, a thorough study of the proposition by a national defense board may decide that it should properly be an adjunct of the coast artillery. It may be found that in its final development it has become such a special and vital feature of our national defense as to make it a department of its own under the national defense board. But these are matters which may be safely left to the future.

The work of the present and the immediate future is to secure by private initiative, the public spirit and patriotism of our coast communities, the funds necessary for the establishment and equipment of the system.

The subdivision of the system and its total cost of five hundred thousand dollars into sections at a cost of ten thousand dollars each, brings the expense of each section easily within the means of each community.

The system as a whole is a national proposition but each section is a local proposition, and the money raised for its equipment is to be controlled by and expended in the community which raised it.

The aviators and mechanics of each section should be recruited from that particular section, and the money for maintenance and upkeep of each section should flow to the community equipping it.

The distance off shore at present is assumed as fifty miles, but with each successive improvement of speed and endurance of the seaplane, the line will be pushed farther out until the cordon is one hundred miles or more off shore.

The observers for each section should be especially trained young men, keen of sense, quick of judgment and thoroughly schooled to recognize (both as to class and individual) every foreign warship. This will form a continuous picket line of aeroplanes or flying-boats, fifty miles or more off shore and two thousand feet or more in the air, around our entire coast from Eastport, Maine, to Brownsville, Texas, and from San Diego, California, to Camp Flattery, Washington, each machine traveling back and forth over its section or "beat," a winged sentinel, forming a cordon, a continuous line of whirling shuttles, weaving a blanket of protection around the country.

The plan has been endorsed by President Wilson, Secretary Garrison and Secretary Daniels, and by aeronautical authorities.

Portland, Maine, was the first to take steps towards establishing a unit of this air patrol system of coast defense, and has raised ten thousand dollars for establishing this unit. Commander Charles L. Poor, of the First Battalion, New York Naval Militia, who was given a flying-boat through the Na-

**America Must be Given a Navy Equal to the Best. If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.**



tional Aeroplane Fund, and Lieutenant R. C. Bolling, commander of the Aviation Detachment, National Guard, New York, which was started with \$12,500, also contributed through the National Aeroplane Fund, have assured the governors of the Aero Club of America of their hearty co-operation in establishing units in New York. To provide for establishing a unit in New York, the "Women of 1915" are raising \$10,000. Commander Edward McC. Peters, of the Naval Reserve of New Jersey, who was presented with a hydroaeroplane through the National Aeroplane Fund, has also offered his hearty co-operation. A number of other states are anxious to establish units, and will do so as soon as funds can be raised for the purpose.

To induce states to raise funds for this purpose the executive board of the Aero Club of America, some time ago, offered to add ten per cent. to any sums raised by the Militia authorities, organizations or individuals, before February 1, 1916. The club was able to do this through the generosity of Mr. Emerson McMillin, the Wall street banker, who offered to add \$100 to every \$900 raised for the National Aeroplane Fund up to the sum of \$500,000.

### Military Aeronautics Before National Security League

AT the National Security League Conference, which was held in Washington during last week, Mr. Albert B. Lambert, president of the Aero Club of St. Louis, addressed the assembled delegates on the subject of military and naval aeronautics. He said in part:

It is a conceded fact by the most eminent authorities of Europe that no great military operation on land or sea is effective to its greatest extent without the use of aviation or aeronautics. Aeronautics covers every branch of the military service.

It has the power to attack and defend. It is a valuable addition to the signal corps; it is indispensable to artillery and coast defense for range finding and spotting; it greatly facilitates the maneuvers of large bodies of troops and precedes cavalry in scouting and reconnaissance. It is even more valuable to the Navy—first, serving as a means for more perfect co-ordination between the Navy and our coast defense.

For reconnaissance one aeroplane can cover the territory of three cruisers. This particularly applies to our Navy, as we are without cruisers; in fact, the aeronautical division of our Navy will have to be organized and equipped to overcome the absence of fast cruisers. This can only be done by the construction of unarmored mother aeroplane boats of sufficient speed to escape the fast cruisers of the enemy. These boats will keep in touch with our battleship fleets. They will carry from twenty-five to fifty aeroplanes of various types. In event of a sea fight, they will be placed back of the line of battleships, and, if necessary, withdrawn within protection of the coast guns.

Aeronautics is now designated as the fourth branch of the Military Service.

The strength of a chain is not greater than its weakest link. The efficiency of our Navy depends upon the co-ordination of all of its departments. Each department should be organized and equipped upon a relative base of efficiency. Deficiency in any one department reflects upon the entire organization.

The aeronautical division of our Navy is so deplorably weak as to decrease the efficiency of our Navy at least twenty per cent. We rank fourth in warship tonnages and twentieth in aeronautical strength.

There is but one explanation for this condition of affairs. Congress does not realize or appreciate the value of aeronautics. That Congress is generous is evident by the total appropriation last year of over two hundred and sixty-four million dollars for military requirements, but when the General Navy Board asked for the sum of five million dollars for aeronautics, the appropriation was cut down to one million.

For whatever purpose the aeroplane makes its flight, to attack, defend or scout, there must be a separate group of officers, either for the handling of machine guns or wireless instruments. The aeroplane is but the head and eyes. Its co-ordinating elements must be as perfect as the system of the human body.

None of our Naval aviators have taken part in the maneuvers of our battleship fleets. Our Navy aeroplanes are not equipped with wireless systems, although we have a code of signals which are fairly effective as long as the aeroplane is within vision. In only one or two instances have the Navy aeroplanes assisted in spotting or range finding in co-operation with our coast defense guns. Important artillery practice has taken place without the presence of the Army aeroplanes.

In other words, we lack the essentials in this most important branch of the military service. An aeroplane hovering 700 ft. over artillery has a vision for range finding and spotting of ten miles. An aeroplane at sea flying at an altitude of 2,500 ft. can on a clear day command a vision of fifty miles. The aeroplane of to-day can maintain a speed from 70 to 95 miles per hour and reach an altitude of 8,000 ft. in six and one-half minutes. Captive balloons stationed near our coast defense guns are more qualified for range finding than the aeroplanes. For scouting, reconnaissance, the aeroplane is ideal. Without these means, troops, artillery and battleships are at a great disadvantage. Aeroplanes are effectively used to locate submarines and mines. An aeroplane flying over the water 200 ft. can locate a submarine without fail at a depth of 40 ft. and generally at 90 ft.

The total number of aeroplanes fit for military service in the United States, including the Army, Navy and coast defense, does not exceed twenty.

Mr. Henry Woodhouse, Governor of the Aero Club of America, was unable to attend the conference in person, but he sent a paper which was read to the delegates. In part he said:

"There is an important question for you to decide: whether you want the United States to be with the first and second class powers or with their colonies. We need two thousand aeroplanes, we have but twelve, and the published estimates of the War and Navy Departments for next year provide for less than one hundred aeroplanes in all. This is the situation in a nutshell, and as the purpose of the Administration in publishing the tentative estimates is to get your opinion of how much you are willing to see this country spend in providing sufficiency in the system of defense, it is up to you to state what you want.

This country can be made fifth in aeronautical equipment by spending \$25,000,000—England, Germany, France and Russia remaining at the head; or seventh, behind Austria and Italy, by cutting the allowance down to \$17,500,000—or it can be left behind Japan, Spain and the Netherlands by allowing only \$10,000,000. Lastly, it can be left where it is, behind the least of the other countries' colonies, by allowing less than \$10,000,000.

Which do you want? Secretary Daniels and the Senators and Congressmen who head the Committees on Naval Affairs, after a conference proposed to allow only \$2,000,000 for Naval aeronautics in 1916 and \$1,000,000 for each year thereafter, until 1920. Money is needed in every branch of the service and they fear to propose a large expenditure.

The Navy itself shows an example of how little can be done with one million dollars. That was the sum allowed for Naval aeronautics by the last Congress. It is now practically all obligated and we did not have any aeroplanes to maneuver with the fleet in the recent war game, and we have not had over six aeroplanes in commission at any one time during the past twelve months!

### "Women of 1915" Raise Fund for Coast Defense

MANY patriotic and defense societies, as well as society, was well represented at the Patriotic Ball, under the auspices of the "Women of 1915," at the Biltmore last Monday evening. The object of the affair was to raise a fund to purchase an aeroplane to present to the coast defense of New York.

The ballroom was decorated in the natural colors. Army and Navy officers attended in uniform.

Mr. Henry A. Wise Wood, vice-president of the Aero Club, and chairman of the conference committee on National Preparedness, who made the address of welcome, spoke of the value of aeroplanes in warfare, and of the duty of every citizen to interest themselves in this phase of preparedness.

Following the address, Miss Helen Herendeen appeared in interpretive dances, one being "The Spirit of Patriotism," and others on the program were Miss Mary Woolston, Miss Anne Fargo Preston, and York Averill, Miss Hazel Moore, who sang "Columbia," and Orphee Langevin, a baritone. The Old Guard Band and the Russian Balalaika Orchestra provided the music.

Flowers and programs were sold by a number of young girls, including the Misses Frances W. Miller, Christina Coles, Amelia A. Ryder, Marian Stuart, Winifred Goldsmith and Marie J. Conrad.

The officers of the national organization of "Women of 1915" are: Mrs. Edward D. Mosley, president; Mrs. Marion Welsh, Mrs. John Orr, Mrs. Emma M. Snedecker, vice-presidents; Miss Mary E. Coughlin, recording secretary; Mrs. C. Bynam Averill, treasurer. Others actively interested in the organization are Mrs. D. B. L. Shepard, Mrs. Grace Ellinwood, Mrs. Charles George Woodford, Mrs. J. Willoughby Mitchell, Mrs. F. W. Monell, Mrs. M. B. Claussen, Mrs. J. W. Loeb, Mrs. Walter Kilby and Mrs. Howard Taylor Lewis.

The patrons and patronesses for the affair included Governor Charles S. Whitman and Mrs. Whitman, Mayor Mitchel and Mrs. Mitchel, Major General Leonard Wood and Mrs. Wood, Major William H. Wiley and Mrs. Wiley, Colonel Oliver N. Bridgman and Mrs. Bridgman, Mr. and Mrs. Marcus M. Marks, Governor R. Livingston Beekman and Mrs. Beekman, of Rhode Island; Professor and Mrs. H. Fairfield Osborn, Mrs. Douglas Robinson, Mrs. Charles Dana Gibson, Mr. and Mrs. Howard G. Cushing, Mr. and Mrs. Austin N. Palmer, Mr. and Mrs. Edward B. Close, Dr. and Mrs. Charles V. Paterno, Mr. and Mrs. John H. Hanan, Rear Admiral Robert E. Peary, Mr. and Mrs. Robert Adamson, Mrs. S. Stanwood Menken, Mrs. Charles F. Roe, Mrs. Walter Pulitzer, Mrs. Noble McConnell, Mrs. Edward N. Breitung, Mrs. William Grant Brown, Mrs. J. Insley Blair, Mrs. William Cummins Story, Mrs. Daniel Guggenheim and Mrs. Simon Baruch.



# THE NEWS OF THE WEEK

## First Burgess Seaplane Delivered to Navy

From the Burgess Company plant there was shipped last week the first of the naval war seaplanes, previously mentioned in these columns. The official tests of the machine are to be made at Pensacola by Clifford L. Webster under the direction of the authorities at the Naval Aeronautic Station. The requirements include an air-speed of 80 miles an hour with full load, while the machine must climb at the rate of 250 feet a minute for ten minutes under the same conditions.

Full load means a total of nearly 1,000 pounds, including an allowance of 380 pounds for pilot and passenger; 206 pounds for tools and instruments, and 400 pounds of fuel and oil, sufficient for a continuous flight of four hours. The weight of the seaplane, light, is just under 2,000 pounds. Like the Cabot craft, the new Navy war planes are equipped with the 140 Sturtevant, and no difficulty has been encountered in fulfilling the requirements in the unofficial trials at Marblehead.

## Martin To Build a Giant Aeroplane

Announcement has been made in California that Glenn L. Martin, whose plant is located at Los Angeles, will construct a giant land aeroplane. It is to be equipped with a new twelve-cylinder 225 horsepower motor. The original plans called for the installation of but one of these motors, but there is a possibility that the plans may be changed to include two of the twelve-cylinder motors with a corresponding increase in the wings and body of the machine.

## Massachusetts Militia Active in Securing Aeronautical Equipment

Activity of the Massachusetts National Guard and Naval Reserve in aviation has become marked. The Aero Club of New England is taking a leading part in the development of the aerial defense of the state, and by the middle of the spring there should be at least three and possibly more aeroplanes available. Two of these are already under construction at the Marblehead plant of the Burgess Company, and funds are being rapidly subscribed for the purchase of the third machine.

One of the craft now under way is the Burgess seaplane, to be flown by Godfrey L. Cabot, who is leading the movement for increased aviation strength in New England. The motor for this machine, a 140 horsepower Sturtevant, recently underwent a block test of six hours. During the trials the motor was under full load, and came through in a most satisfactory manner. A thrust exceeding six hundred pounds was developed at a propeller speed of 1,350 revolutions, and the engine showed no signs of the slightest trouble at any stage.

## Goodyear Expert Going to Europe

Ralph H. Upson, aeronautic expert of the Goodyear Tire & Rubber Co., Akron, Ohio, and balloonist of international reputation, has been appointed special observer of military aeronautics in the European conflict. He will officially represent the National Guard, and will carry credentials from the War Department at Washington.

Upson's appointment comes as a tribute to his eminence in the aeronautic field, his success in developing the practical uses of the balloon, and the many victories he has won in actual ballooning.

His ballooning in Europe, where he won the James Gordon Bennett international cup race in 1913, with the balloon "Goodyear," brought him into close touch with the prominent aeronautic engineers there, and gave him familiarity with the field in which his observations will be made.

Although a young man, he was selected as a member of the special committee to co-operate with the Edison Naval Advisory Board in their consideration of the application of aircraft to warfare. During the past year he has "broken in" a number of government men, placed under his instruction, introducing them to the art of ballooning.

## The Packard Aviation Field

The Packard Motor Car Company has acquired a large tract of land on Lake St. Clair near Mt. Clemens, Mich., for an aviation field, to be used in connection with its aviation branch. Aeroplanes will be received within a short time, and experimental work will be begun as soon as possible. As has been announced, the Packard Company does not contemplate the manufacture of complete aeroplanes for the present at least, but it will devote its energies to the Packard aeroplane motor.

## Wardrop Lectures on Aircraft and Preparedness

At the Thursday afternoon meeting of the National Special Aid Society, held in the headquarters of the society at 597 Fifth avenue, G. Douglas Wardrop, managing editor of AERIAL AGE, addressed the members on the need of adequate aerial preparedness in this country. The message conveyed was so impressive that \$1,000 was immediately subscribed to the National Aeroplane Fund, and a movement started with its object the securing of \$10,000 for the purpose of instructing aviators for the twenty-three states that have militia organizations.

On Friday evening Mr. Wardrop delivered an illustrated lecture on "The War in the Air" before the members of the Friday Evening Club of Morristown, New Jersey. The lecture, stereopticon pictures and motion pictures were much enjoyed.

The first dirigible of the U. S. Navy nearing completion at the plant of the Connecticut Aircraft Co., New Haven.





### Committee Will Aid Admiral Peary

The Executive Board of the Aero Club of America has authorized Admiral Robert E. Peary, organizer of the Aerial Coast Patrol system, to form a Committee of Army, Navy and Militia authorities to co-operate with him in forming a chain of aerial coast defense stations around the nation.

The Executive Board has also written to Secretary Garrison and Secretary Daniels and to E. Lester Jones, Superintendent of the United States Coast and Geodetic Survey, inviting them to co-operate with Admiral Peary.

The defense plan calls for the division of the coast of the whole country into sections, each about 100 miles long. In each one of these sections there is to be established a station with a hangar for a seaplane and all equipment necessary for minor repairs.

The plan has received the indorsement of President Wilson, Secretaries Garrison and Daniels, and aeronautical authorities. Portland, Me., has established the first unit, and the first unit for New York State is to be established by the "Women of 1915," who held a subscription dance at the Hotel Biltmore last Monday night to raise funds.

Commander Charles L. Poor, of the First Battalion, New York Naval Militia, and Lieutenant R. C. Bolling, Commander of the Aviation Detachment of the New York National Guard, have promised their co-operation in establishing the New York units of the aerial coast patrol.

### U. S. Government Building a Superior Seaplane

A dispatch from Washington says, on the authority of a high official, that there is under construction at the Washington Navy Yard a seaplane that will, in the expectations of the government officials, be superior as a fighting unit to anything that is now flying.

The government undertook the building of an aeroplane because the manufacturers here were so rushed with foreign war orders that there was delay in filling other orders. So experts connected with the Bureau of Engineering and the Bureau of Construction and Repair were assigned to the task and the new aeroplane was developed.

"Minute examination of all the newest foreign machines was made by representatives of this government in England and on the Continent, and the results of their investigations were sent to Washington," says the correspondent.

"It is understood the Bureau of Engineering has invented a motor which surpasses anything yet seen in an aircraft, both as regards speed and economy of fuel consumption. Several innovations in the way of offensive details have been incorporated which will make the new machine superior as a fighting unit to anything now flying.

"The new aircraft, as in the case of all the government machines, is to be a seaplane and will be constructed in sections so arranged as to make assembling very simple. In their knockdown state twenty or more of the new aeroplanes may be carried by a battleship, and assembled as needed."

### Oil Prospectors Have a Hydroaeroplane

A party of seventeen American oil men have started from Pittsburgh in a special train for New Orleans on their way to Colombia, South America, to inspect oil lands and to prospect for oil. At New Orleans the party will board the private yacht of Ledyard Blair of New York, on which they will sail to Mexico to inspect properties owned by some of the party. Then the prospectors will sail for Colombia and will proceed up the Magdalena River to an oil region covering about 5,000 square miles. Roberto de Maras, who has a concession from the Colombian government covering practically all of the country, will be a member of the party. The prospectors are taking with them a hydroaeroplane, which will be used in making trips into territory which would otherwise be inaccessible.

### The National Aeroplane Fund

The following subscriptions to the National Aeroplane Fund have been received since January 15th: Mrs. Elizabeth S. du Pont, \$500; Mrs. Mary W. Harrison, \$100; Mr. Lewis S. Clark, \$100; Mr. Alba Johnson, \$100; Herbert M. Sears, \$50; D. Herbert Hostetter, \$50; Dr. J. W. Elliott, \$50; Henner Jennings, \$25; Mr. and Mrs. Roger F. Hooper, \$20; George C. Beach, \$20; Howard L. Goodheart, \$50; W. S. Bergland, \$10; Morton Harvey, \$5; William Beebe, \$5; Mrs. Griselda W. Hobson, \$1; Edward S. Stoddard, \$1; Mrs. Edward S. Stoddard, \$1; Mrs. F. G. Strachan, \$1.

### Thomas News

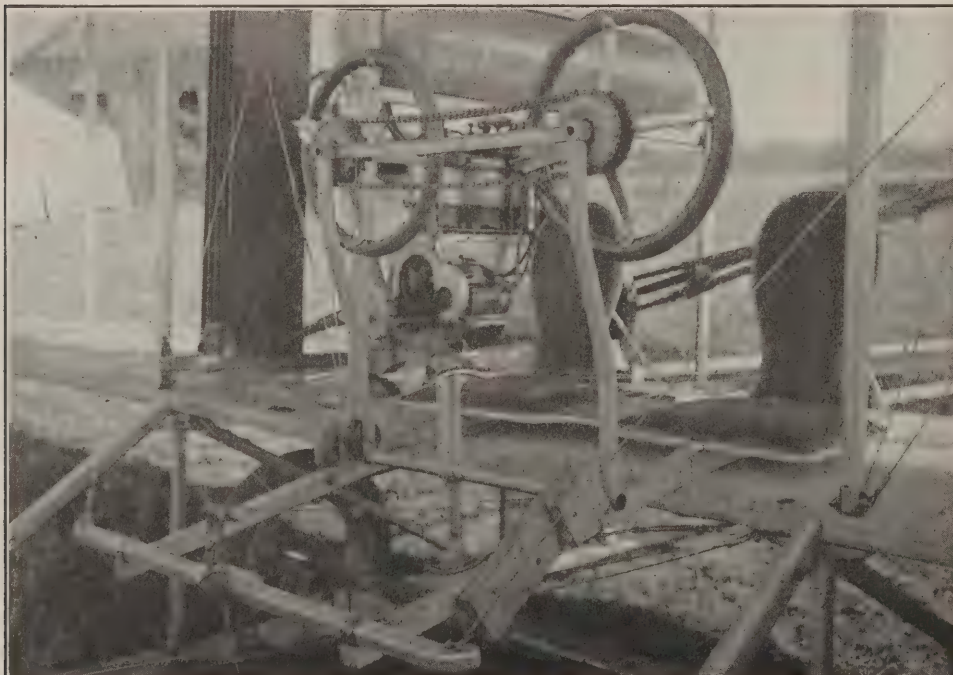
A very fair amount of flying has been accomplished this week, due to the favorable condition of the ice and less wind than usual.

The latest Thomas product, the type D2 military tractor with the new 135 h.p. Thomas aeromotor, has been taken up for a number of trial flights by Aviator Frank Burnside. Many people who have watched the big machine circling over the outskirts of the town have expressed their highest admiration of its appearance and performance.

Chief Instructor William Brock, of the School of Aviation, recently awakened the inhabitants by an early morning flight over part of the town while flying from the aviation field to the ice. The work on the ice is rapidly completing the instruction of a number of advanced students who remained at Ithaca when the winter school moved South.

### Moore Resigns from Gyro Motor Co.

Mr. R. S. Moore, who has been associated with the Gyro Motor Company, of Washington, D. C., for the last five years as one of the designing staff, has severed his connection with that company, in order to devote himself entirely to some new motor experiments, which he plans to undertake at 35 Maple street, Tacoma Park, Washington, D. C.



The Wright dual wheel control, used exclusively on the school machine at Augusta, Georgia.



### Aircraft Lecture Before Automobile Club

Under the auspices of the Automobile Club of America, Mr. William Menkel, of the editorial staff of the *Review of Reviews*, gave his illustrated lecture on "Aircraft in Use in the Great War" before the Employees' Association of the club on the evening of January 12th.

The men comprising the association are trained mechanics, leaders of their craft and masters of the internal combustion motor to an extent equalled by probably no similar body of men in the country.

The keenest interest was shown in the illustrations of the various models thrown upon the screen, and it was freely predicted among those present that, if necessary, at least a hundred men could be sent to the Hempstead hangars qualified to become practical flyers and mechanics in but a very brief time, because the only thing they would have to master would be the technique of flying.

### Puget Sound News

BY ROBERT LA TOUR.

Mr. Ed. Hubbard is now licensed hydro pilot No. 45, having successfully passed the tests in the presence of Mr. Westervelt acting for the Aero Club of America.

Mr. T. T. Maroney has returned from his Southern trip. He now has his machines in his new hangar on Lake Union.

The Northwest Aero Club's large hangar on Lake Union is completed, and the three machines will be moved there soon.

A banquet for members and their friends is planned for the near future.

Upon the resignation and departure of C. G. Westervelt, the designer of the two new machines, Mr. Hull has been elected to the office left vacant by him, that of club secretary.

Mr. Gustav Strommer, of Tacoma, is building a large two-engined passenger-carrying hydro for this summer's business. The machine will have an abundance of power, as the motors are to develop 160 horsepower each.

Aviators D. Gordon Edelman and Fred S. Thompson were in Seattle on a short visit last week while en route to Victoria, B. C.

### A Disclaimer

New York papers carried a report a few days ago stating that the Hon. F. C. G. Eden had met with an accident while flying with a lady passenger at West Palm Beach. We are in receipt of the following telegram from Mr. Eden contradicting the report: "Account of accident utterly untrue. Gas pump failed temporarily. Made splendid glide over two thousand feet to ocean. Had to beach boat. Sea too rough to effect repairs. At no time danger or other trouble."

### Fear an Air Raid on Powder Plants

Fearing that the machines might be seized and used in an attack on powder mills in Delaware and New Jersey, Federal agents at Philadelphia have asked Robert E. Glendinning and Clarke Thompson, owners of hydroaeroplanes, either to dismantle their machines, or to place a guard over them. The hydroaeroplanes are now on the Delaware river. This precaution is supposed to have been taken as a result of reports from towns near Penns Grove, N. J., that an aeroplane had been heard circling over the powder mills at night.

### Remarkable Performance of Thomas Tractor

A Thomas Model "D" military tractor made very remarkable speed tests on January 26th at the Thomas flying grounds, Ithaca, New York. An average speed of ninety-five miles per hour was sustained, and the highest speed gained was one hundred and two miles per hour. Mr. J. J. Frawley, representing the Aero Club of America, witnessed the tests.

### N. M., N. Y., Detachment Sworn In

The aviation detachment of the First Battalion, New York Naval Militia, was sworn into service on Monday night, January 17, 1916, by Captain Charles L. Poor. The following enlisted men have started training for the detachment: Ensign Lee H. Harris, who has taken the course at the Curtiss School, Eustice L. Adams, Harold R. Eustis, Robert J. Kahl, who has taken a course as mechanic at the Curtiss School, Frederick E. King, Frank W. La Vista, Charles J. McEnroe, Walter L. Roder, Howard W. Ross.

### Centenary of Peter A. Frasse Co.

The year 1916 marks one century in business for the Peter A. Frasse & Co., Inc. Some of the company's old ledgers which are still in existence show transactions with Aaron Burr, Alexander Hamilton and many of the other well-known earlier families of this city. In the little shop of the original Frasse was made the model engine for the steamboat invented by Robert Fulton.

This company is now about to enlarge its operations considerably, and has purchased a plot 65x344 feet, close by the tracks of the Central New England Railway in Hartford, Conn., on which a new mill and warehouse will be erected. Hartford was chosen as the location, as it is considered the best point from which to serve the trade in western New England, and is also in direct communication with Pittsburgh and within easy reach of the company's warehouses in New York, Buffalo and Philadelphia. The building will be three stories and of either mill or concrete construction. In the heat-treating department, furnaces for annealing, heat-treating, case-hardening and tempering of steels will be provided. Draw benches for cold drawing will be installed and lathes for machining steel bars. The equipment will enable the company to deliver on short notice anything that a manufacturer might need in the way of raw material, as well as semi-finished material in the various grades of steel of its manufacture.

### Niel MacCull, Jr., Discusses Aeroplane Design

At a meeting of the Mechanical Engineering Society of Columbia University, held in the Engineering Building on January 14th, "Aeroplane Design" was the topic of discussion. Neil McCoull, Jr., a graduate of the Columbia School of Engineering in 1913, was the lecturer. Owing to the great advance in aeroplane construction occasioned by the European war, his topic proved extremely timely and interesting. The lecture was one of a series given before the society at intervals during the year.

### New Ashmusen Plant at Providence

The Ashmusen Manufacturing Co., makers of the Ashmusen adamantine motors, which has been located at King's Park, Long Island, has moved its factory to Providence, Rhode Island, where the manufacture of eight and twelve cylinder motors will continue. The management hope that within six weeks they will be turning out one engine per day.

Some of the students at the Stinson School of Aviation. Left to right: A York Wilks, Montreal; W. N. Brown, Toronto; Herbert McKenzie, Victoria; Joseph Gorman, Ottawa; L. C. Angstram, Toronto; J. A. Harman, Uxbridge; Marcel Dubuc, Montreal; G. S. Harroner, Montreal; Paul S. Gadbois, Montreal; Jack E. Walker, Regina.





## WORLD'S RECORD BROKEN BY MARTIN MODEL "S" SEAPLANE

ON the morning of Wednesday, January 12th, Chief Pilot J. Floyd Smith, accompanied by Donald W. Douglas, Chief Engineer of the Glenn L. Martin Company, broke the world's altitude record for a seaplane with passenger by ascending 12,362 feet in the new Martin seaplane, Model "S."

Starting out with 600 pounds useful load aboard, the contracted climb of 3,000 feet in ten minutes, was first made. Continuing on up, in spite of the extreme cold, Smith reached his highest point in one and one-half hours. The intense cold cooled the motor down to 100 degrees, but for which fact a higher level might have been attained.

On returning to the hangars, measurements were made and it was found that there was still 140 pounds of fuel and oil aboard. The same altitude might therefore have been reached with a second passenger aboard in place of the excess fuel.

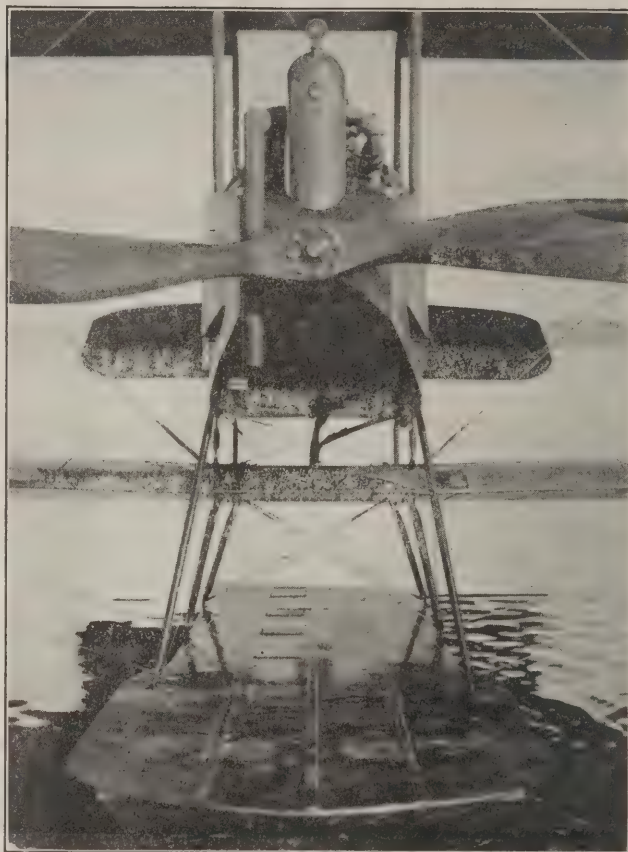
The new seaplane, which is the first of four to be delivered to the United States Army, exceeded the specified speed range of 42 to 71½ miles per hour, by actually making 40 to 75 miles per hour with full load aboard.

### GENERAL DIMENSIONS.

Top span, 51 ft. 8 in.  
Bottom span, same.  
Length over all, 28 feet.  
Fuel capacity, 70 gallons.  
Climbing speed, 3,000 feet in 10 minutes.  
Gliding angle, 15 to 1.  
Useful load, 800 pounds.  
Air speed (loaded), 40 to 75 miles.  
Weight of machine, 2,200 pounds.  
Motor and horse-power, Hall-Scott "6," 125 h.p.  
Control, 3-in-1.  
Types, Model "S," either land or water chassis.

The Hall-Scott motor used was of the new A-5 type. The first of these engines to be completed went through the regular course of factory tests at the company's plant, and was then thoroughly tested out under flying conditions in the Glenn L. Martin military tractor hydroaeroplane, which results came to a splendid climax on January 12th, where it gave remarkably satisfactory results. Not content with this, the manufacturers conducted an eight-hour running test under full load at their plant under the supervision of Hildreth & Co., well-known New York consulting engineers. The average speed of the engine for the eight hours and ten minutes of test was 1230 r. p. m., and the power delivered at this speed was 142 h.p. The engine consumed 10.25 gallons of ordinary garage gasoline per hour, and 0.50 gallons of oil during the same length of time. This is equivalent to only 0.45 lbs. of gasoline and 0.026 lbs. of oil per horsepower hour.

At first glance this new "A-5" reminds one of that famous



German engine, the Mercedes, because of its six vertical water-cooled cylinders, and overhead camshaft and inclined valves. Closer inspection of the design shows, however, that this is by no means a copy of the Mercedes, for many of the details are much more refined.

One of the most noticeable details is the very neat way of enclosing the cams in an oil tight casing. Though the cams run in oil, there is no leakage even while the engine is running. Without question the whole arrangement of the valve mechanism is the most excellent feature of this engine. The valves, which have the large diameter of half the cylinder bore, make it possible to secure a high volumetric efficiency and consequently high m. e. p.



The Model "S" Martin Seaplane which broke world altitude record.



# THE SUPREMACY OF AMERICAN-MADE MACHINES

THAT the 200-horse power "Fokker" German monoplane, which, according to London dispatches, has brought down 13 British aircraft during the last month, is soon to be surpassed by American machines is the opinion of aeronautical authorities including Alan R. Hawley, president of the Aero Club of America; Henry A. Wise Wood, president of the American Society of Aeronautic Engineers; Alberto Santos-Dumont, Henry Woodhouse and John Hays Hammond, Jr.

Mr. Hawley said:

"Supremacy in the air at the theatre of war has shifted from one side to the other many times during the past eighteen months. At first the allies were supreme, then the acquisition of faster types of aeroplanes by the Germans shifted the control, particularly as they had perhaps 2,000 aeroplanes more than the French and British combined—the latter having found it advisable to discard the monoplanes.

"Then Great Britain and France acquired the two-engined "Caudron" biplane, and fast aeroplane "chasers," which regained for them the supremacy of the air.

"This new German monoplane will undoubtedly bring out the speedy French and British biplane, which have not been used in large numbers, I understand, because of the difficulty of having wide enough landing grounds for them near the theatre of war."

Mr. Woodhouse says:

"The 'Fokker' monoplane mentioned in the dispatch comes in the class of aeroplane 'chasers,' in which are comprised all the aeroplanes capable of making between 95 and 160 miles an hour, carrying a pilot and gunner, or pilot alone, who also acts as gunner.

"The usual 'Fokker' monoplane is only 39 feet 9 inches in width, 24 feet 6 inches long, equipped with an 80-horse power motor, and with the exception of the wings, the construction is entirely of steel tubing. That same monoplane, increased in size a few feet and equipped with a 200-horse power motor, ought to be capable of making 160 miles an hour.

"Both the British and the French have aeroplanes capable of such a speed, but have not used them extensively because it has not been necessary, since the other side was not using them. It is somewhat difficult to pilot these small, fast machines, and being very short of trained pilots, the authorities have thought it best not to impose any unnecessary hardships on the pilots they now have.

"But this development does not by any means indicate that supremacy in the air is in the hands of the Germans anywhere except on Russian territory, where the Russians have only a few hundred aviators compared to more than a thousand German aviators. It takes several thousand aviators and aeroplanes to give supremacy.

"As a matter of fact, the British Navy has had supremacy of the air throughout the war—that being largely due to the great number of 'America' and 'Super-America' flying boats—the largest made in this country—which are equipped with two 160 horse-power motors. Over one hundred of these large machines and about 500 smaller types have been delivered to Great Britain in the past twelve months. One American firm alone has orders for 1,100 more, including some huge flying boats which are veritable air cruisers. Several other firms are now constructing large land and water aeroplanes with two or more engines, but I am not at liberty to give details.

"Considering these facts, and the fact that the United States has less than thirty aeroplanes in the Army and Navy, it is evident that unless Congress appropriates \$25,000,000 for aeronautics for the Army, Navy and Militia, this country will never emerge from its present aeronautical rank, which is with the colonies of other nations. Even China has more aeroplanes than the United States."

Mr. Santos-Dumont said:

"Whoever may be supreme in the air now, I believe the control will go to the nation that will get the giant aeroplanes that are being built in this country today. In a short period of ten years the aeroplane has developed more rapidly than did the automobile. With the aeroplane we can now travel over 140 miles per hour. For commercial purposes and for international communication both automobiles and railroads reach a point where their utility ends. Mountains, forests, rivers and seas block their progress. But the air affords an unhindered speedway to the aeroplane; it can travel over mountains, forests and seas. It can unite Continents. The atmosphere is our ocean, and we have ports everywhere.

"Recently I visited an enormous factory in the United States. There I saw thousands of skilled mechanics engaged in the

building of aeroplanes, of which from twelve to eighteen were finished daily. To expedite the shipments of these machines, railroad sidings had been constructed into the factories themselves. To me the scene looked more like a dream than a reality. From among the aeroplanes constructed there is one capable of flying over 600 miles and carrying 30 people.

"This aeroplane is six times larger than any yet tried. It can carry enough gasoline to give it a cruising range of more than six hundred miles, at a speed of seventy-five miles per hour. By decreasing the load so as to increase the fuel capacity this distance can be greatly increased. The power plant consists of seven motors—six of 160 horse-power each, and one of forty horse-power. With about eight passengers this machine has a further capacity for carrying 700 gallons of gasoline, 60 gallons of oil and a useful load of 3,000 pounds. By decreasing the 3,000 pounds cargo the number of passengers can be increased to thirty or more.

"This machine is built with three planes spreading 133 feet. The length is 68 feet; the rudder area is 54 square feet; fixed tail area, horizontal, 126 square feet. The weight of the hull and planes is 8,000 pounds, and of the motors 4,000 pounds. With a crew of eight men, weighing 1,200 pounds, oil and gasoline weighing 5,250 pounds, and a load, presumably of ammunition, of 3,000 pounds, there is a weight which can be carried through the air at a speed of 75 miles per hour or more, totalling 21,000 pounds or more than ten tons! This is unprecedented.

"This new machine presents several significant and valuable aspects. The 1,000 horse-power motors drive three propellers. Two tractor screws are set at either side of the boat hull in front and one pusher screw is set amidships in the rear. Once an altitude is gained, two of these propellers enable the boat to sail on an even keel. In descending it is said that the boat can be propelled by a single motor, maintaining a gliding angle of about 15 to 1, enabling it, if desirable, in descending from a height of two miles, to traverse thirty miles of land. Armored in all vital spots, capable of flying nearly 700 miles, of carrying the new aeroplane gun projecting 9-centimeter shells, you can understand what a formidable aerial dreadnaught is being turned out for effective work on the battle-front of Europe."

## Model News

(Continued from page 479)

On Thursday, January 20th, Mr. Cavanagh spoke to the pupils of the Franklin School, East Orange, N. J. The subject of the talk was "The Construction and Flying of Model Aircraft." On Wednesday the 26th and Thursday the 27th Mr. Cavanagh will speak to the students of the Ashland and Washington schools of East Orange, N. J. Mr. R. C. King, Jr., represented the club at the last meeting of the Y. M. C. A. Model Aero Club, Orange, N. J. For further particulars address the Secretary, 29 West Thirty-ninth street, New York City.

## The Illinois Model Aero Club

BY ARTHUR E. NEALY

Captain Horace B. Wild, a licensed aviator and balloonist, spoke to the club at the last Friday night meeting on the subject of aviation and preparedness as a factor in bringing about world peace. The lecture was exceedingly interesting, both from the laymans' point of view and the professional's. The slides accompanying the talk were new and startling, showing up the European conflicts in a new light. Mr. Wild took his listeners for a series of picture-flights over Chicago's lake front, Loop and South Side; over Germany in a giant Zeppelin; over the aerodromes of France in a monoplane, and over Italy in an aeroplane.

Mr. Emil Laird, recently of the Sloan Co., has returned to the scene of his early successes and is working on machines which he will fly in 1916. He informs us that Mr. George Weaver, former Secretary of the I. M. A. C., is still with the Sloan company in Plainfield, N. Y.

From the reports, the I. M. A. C. will have many of its star model performers of 1915 flying large aeroplanes in 1916. The names of members who contemplate building large machines this year will be withheld in courtesy to the latter, but it is safe to say that nearly all of the machines will be of the light type—the type which, in the United States, is most strongly sponsored by the I. M. A. C.

It is hoped that by next fall a meet can be held, in which at least five or six large machines can compete, all the entrants being members of the model club.



# THE DEVELOPMENT OF THE MILITARY AEROPLANE

THE illustration published on the opposite page through the courtesy of *The Aeroplane*, shows the stages of development of the military aeroplane, from the first types used in war, by the Italians in Tripoli, down to the types used recently in the present war. Naturally, the improved types only just put into use by the Allies are not included, as they would be of use to the enemy.

The key herewith gives the positions in the large Plate of the various numbers.

No. 1 is the old Maurice Farman "longhorn" biplane with 70-h.p. Renault engine. This was the first aeroplane to be used on active service by any power, and was employed to a considerable extent by the Italians in Tripoli against the Turks, for scouting and for the dropping of elementary bombs.

No. 2 is the Nieuport two-seater monoplane employed in the same campaign, generally fitted with an 80-h.p. Gnôme. The principal work of this and the preceding machine was scouting, but a little bomb-dropping was also done. Machine or other guns were not carried, as the Turks offered no aerial opposition. Reconnaissance was usually carried out at what would now be deemed a ridiculously low altitude, this being rendered possible by the absence of anti-aircraft guns and the prevalence of ineffective rifle-fire.

No. 3 is the 80-h.p. Bleriot tandem two-seater. This machine was used largely by the Bulgarians in their operations against the Turks. Bombs of small size were dropped by hand on mosques and other places likely to afford shelter to enemy troops, or to cause annoyance to the enemy if destroyed.

No. 4 is the Deperdussin monoplane, used in some degree by the Turks in the Balkan wars. As Turkish pilots were employed, most of its work consisted in damaging those who handled it.

No. 5 is the Henri Farman biplane, 80-h.p. Gnôme. This machine was used with varying success by the Serbians in their strife with the Turks, chiefly at Scutari, and later with the Bulgarians. This machine was probably the best reconnaissance biplane at that date, and even at the beginning of this war it was largely used. Practically all "pusher" biplanes are its direct descendants.

No. 6 is the D. F. W. biplane. The Turks used these steel-built biplanes, supplied by Germany, to a limited extent. These machines possessed a large measure of inherent stability, but their climbing power was limited to their enormous weight. They were fitted with 100-h.p. Mercedes engines.

No. 7 is an uncouth Ago biplane, also supplied by Germany to Turkey. This machine, with a 150-h.p. Argus motor, carried a very fair load, but was an appalling brute to fly, owing to its big side area forward.

No. 8 is the Rumpler-Etrich Taube, 120 Austrian-Daimler engine, another Turkish import. The foregoing Turkish aeroplanes all did fairly respectable work, chiefly because they were fitted with reliable engines and had the sky largely to themselves, for in the Balkan War there was no fighting in the air.

No. 9 is an early L. V. G. biplane, 100-h.p. Mercedes engine, used extensively by the Germans in the early part of the present war. Its elaborate chassis made it easy to land in bad ground, and it was quite a good all-round machine. Improved types of the same make are largely used by the Germans and are generally mistaken for Albatrosses or Aviatiks, much as all German monoplanes are called Taubes.

No. 10 is a B.E.2b, a product of the Royal Aircraft Factory, resembling Mr. de Havilland's B.E.2, and preceding the B.E.2c. A large amount of reconnaissance was done on this type chiefly before and during the retreat from Mons. The weak points of this machine was its lack of power, as it only had a 70-h.p. Renault engine. Otherwise it was quite a good machine at the period. Some of the type may still be in use abroad, and they are quite largely used for school work.

No. 11 is a Morane "Parasol" monoplane, produced by the Morane-Saulnier Company shortly before the war. This machine is very popular among certain aviators, chiefly on account of its wide field of vision and its rapid climb. It is, however, very tricky to handle when near the ground. This machine is usually fitted with an 80-h.p. le Rhône motor.

No. 12 is a Bristol "Scout" biplane, a machine which has done a vast amount of war flying in the hands of many of our best pilots. Fitted with a 100-h.p. monosoupape Gnôme, it is one of the fastest machines of its type in the world, and its landing speed is low.

No. 13 is a German three-seater "battle-aeroplane," a powerful tractor biplane, which has done considerable execution in aerial flights. Fitted with machine-guns firing both fore and aft, and possessing superior speed to the majority of Allied aeroplanes, it at one time dominated the air over certain sections of the fighting line.

No. 14 is a Henri Farman version of the Voisin, a steel

biplane of particularly fine construction, fitted with a Salmson engine. Many of the defects of its prototype were removed, and it is an excellent example of the heavy pusher biplane.

No. 15 is a standard straight-winged Aviatik biplane used largely for reconnaissance by the Germans. With the L. V. G. and Albatross it shares the bulk of German air work.

No. 16 is a modern Albatross biplane with similar attributes to No. 15. The claw-brake in the chassis should be noted. This fitting enables the machine to make a standing start with the engine running all out, without external assistance, the brake being released by the pilot from his seat. This brake also assists landing in a confined area.

No. 17 is an example of the German twin-fuselaged twin-engined biplane, familiarly known as "two-tails" or "Wong-Wong," on account of its peculiar posterior appendage and the singular ululations set up by its engines when they are not firing in time. This machine achieved most of its success in the columns of the British halfpenny press. As an aeroplane it was a "wash-out."

No. 18 is a Martinsyde single-seater "Scout" biplane, of a type designed and constructed as a moderately fast and very strong machine which would stand a good deal of knocking about by pilots of average ability—or less than that—who are not esteemed highly by observers. It has done remarkably good work in "strafing" German aeroplanes, even when flown by officers whose bravery and marksmanship have exceeded their skill as aviators.

No. 19 is a Vickers gun-carrying biplane with a 100-h.p. monosoupape Gnôme engine, the first gun carrier of the "pusher" type to be used largely by the R. F. C. It has been of high value as a fighting machine.

No. 20 is a Bleriot armored monoplane with monocoque fuselage, the armored cockpit, fuselage and tail being separate and replaceable units. This machine had immense possibilities, as it was practically invulnerable to anything less than direct hits by shells, but apparently it was developed no further.

No. 21 is a twin-engined Caudron biplane ("de bombardement"), the first multi-engined machine built by the Allies to take the air with good effect. This machine in its various types has made itself particularly objectionable to the Germans because it can carry an enormous weight of bombs, is very fast and a splendid climber. On a recent occasion one of these machines escaped from a German biplane by outclimbing it while carrying a heavy load—an almost unprecedented feat.

No. 22 is a Morane monoplane ("de chasse"), with Hotchkiss gun firing through the propeller. On a machine of this type M. Gilbert conquered a number of German machines, among them being a "battle-aeroplane" with a crew of three.

No. 23 is a Voisin gun carrier; a machine with good practical qualities marred by unscientific aerodynamics and curious ideas in construction.

No. 24 is an 80-h.p. Avro biplane, a machine which proved its merit very early in the war, owing to its extraordinary efficiency and excellent construction. A notable feat was the raid on Friedrichshafen by naval officers detailed for land work, who started on three Avros without any preliminary test flights.

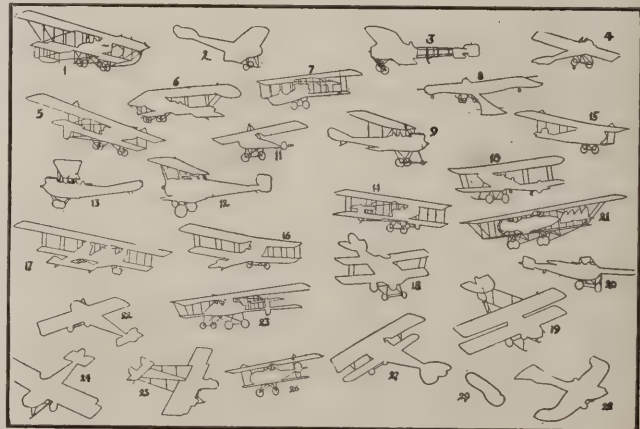
No. 25 is a Maurice Farman "shorthorn" biplane, a fast pusher biplane of comparatively light loading, used largely both by the French and British Flying Corps with excellent effect, especially with the newer and higher-powered engines.

No. 26 is a Fokker biplane scout—the German reply to the Allied scout machine. Variations of this machine have been extremely successful on the Western Front, as also has been a monoplane of the same make strongly resembling a Morane.

No. 27 is a Nieuport "scout" biplane with a very small lower plane and a gun firing upward through the top plane, an extremely useful feature, as it enables the pilot to attack enemy aircraft from below, their most vulnerable and undefendable part, as few aeroplanes can fire vertically downwards.

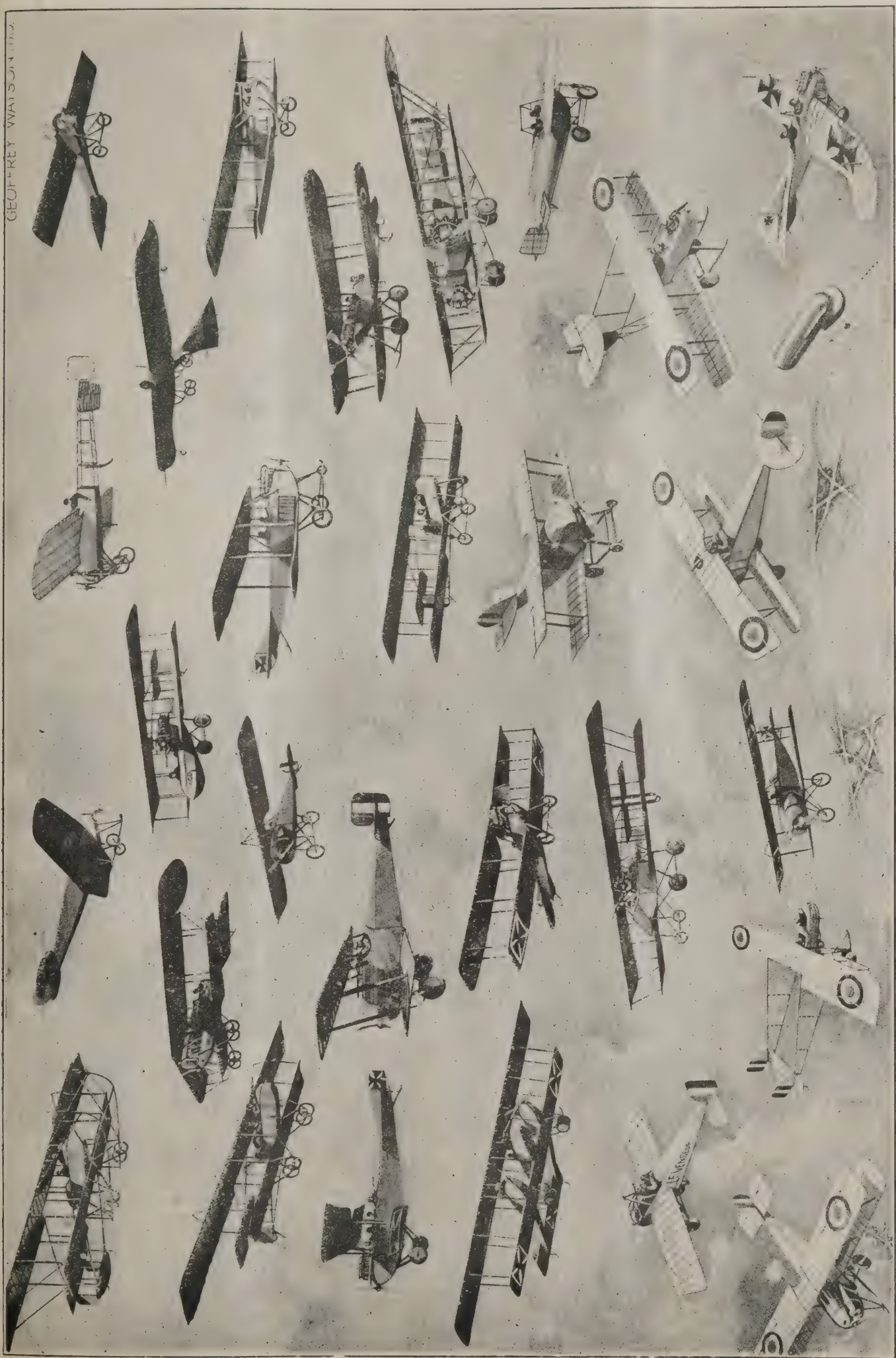
No. 28 is a Taube of another date, used early in the war, but now obsolete, its speed and rate of climb being too low for modern conditions. This type was built by numerous German firms.

No. 29 is a kite-balloon, a Japanese invention improved by the Germans. One of these instruments was used by the Italians in Tripoli to assist their naval bombardment, the balloon being operated from a hulk. Kite-balloons are now used by all the belligerent powers and are found invaluable for artillery spotting.





GEORGE WATSON LTD.







# FOREIGN NEWS

By JAMES E. CLARK



## AUSTRIA

On the upper Ikva a Russian aeroplane was shot down recently and its officers were made prisoners.

In the district southeast of Brzezany a Russian aircraft division recently dropped bombs, but without effect, according to the official reports of the attack.

## GREAT BRITAIN

After an interval of several months, German aeroplanes have again crossed the channel and attacked English towns. The city of Dover Kent, was raided twice on Sunday, January 23, by an aeroplane. Nine bombs were dropped, killing one man, injuring six persons and starting a number of fires. The first attack was made at 1 A. M. A second attack was made on the same locality shortly after noon by two seaplanes. No damage was inflicted by the second attack. A third attack also was made on the following day. London regards these raids as forerunners to more important attacks, and is looking forward now to the coming of the Zeppelins. The last previous occurrence of this nature was on October 13, when 55 persons were killed and 114 were wounded by a Zeppelin attack on London.

Although it occurred last November, announcement of the death of Miss Trchawke Davies has just been made in London. She was an aviatrix of ability, and with the late Gustave Hamel had made several notable flights. As the result of several accidents she had suffered a long illness, but was apparently recovering when heart trouble appeared and she died suddenly. It was at her request that the announcement of her demise was withheld from the public. Miss Davies became famous in April, 1912, when she and Hamel established an aeroplane record for passenger carrying between London and Paris. In June, 1912, she took part in the first aerial derby around London. Later she established another record, being the first woman to loop the loop.

In the British House of Commons Harold J. Tennant, Parliamentary Under Secretary for the War, denied that the German air service had been developed to a point where it outranked that of the British. He said that the military authorities were satisfied that their airmen were giving a good account of themselves. Mr. Tennant declared that the German method of fighting in the air was to remain on the defensive, and the new Fokker planes with which the Germans are equipped are well adapted for that purpose, but they are incapable of making long flights. He contended that if the Germans took the offensive and went behind the British lines they would meet with machines equal in efficiency and speed. Mr. Tennant said that nearly all the fights occurred on the German side of the lines; therefore, when there are casualties, the Germans can conceal their own losses while advertising the British. But the "Mail" of London is far from satisfied with the explanation of the Secretary. It says that Mr. Tennant's reply is "curious and incomplete," and that it does not explain the fact of the British losing fifteen aeroplanes in the past month, while there were no corresponding German casualties.

"The statement that the Germans hide their losses," the Daily Mail says, "is unsatisfactory, as the British airmen see when they disable a German machine and are not likely to fail to report."

British authorities in discussing the effectiveness of the new German aeroplane, the Fokker, claim that for every German airship that flies over the Allies' line four British airships cross into German territory. Therefore as the British and French take greater risks than their enemies, losses of the Allies are bound to be larger, in appearance at least.

But a dispatch from the British headquarters in France declares that the panic which the appearance of the Fokkers has caused is needless, and that a complete answer to criticism against British aircraft and in favor of the Fokker is found in the exploit of a British airman who on January 17 attacked three Fokkers single-handed and forced each in turn to descend.

On the day in question this aviator was escorting another aeroplane on a reconnaissance when two Fokkers appeared behind that machine. The battling British pilot was 2,000 feet above when he spied the Fokkers. He immediately dove and, selecting one of the Germans, gave battle. After a few rounds the Fokker made a nose dive of 6,000 feet and was seen no more. Meanwhile the second Fokker had climbed above the British aviator, but the latter immediately ascended and, flying within 100 feet of the German, he opened fire. After thirty rounds this Fokker also made a steep nose dive and landed in a plowed field. The British airman followed him down to within 4,500 feet of the earth. Again the British pilot ascended to an altitude of 11,000 feet, where he discovered a German albatross above and behind a British scout. After a brief encounter the Albatross also retired.

On returning to his own lines this same pilot saw another Fokker among a group of British biplanes on a reconnaissance. He flew to the attack, and, like the others, this German took refuge in a nose-dive, and when last seen was going toward the earth at a terrific rate.

On the same day, January 17, another British pilot attacked a Fokker. The latter suddenly emitted a jet of flame and dove steeply to the earth. Two other Fokkers are also reported to have beaten a retreat when attacked by British aeroplanes. British headquarters also reports the apparent destruction of still another Fokker on this date. The dispatch says:

"Again, on January 17, two pilots on escort duty with bombing machines were waiting for two laggards when they were attacked from above and behind by a single-seater Fokker. The pilot was in a standing position and fired through his propeller, opening with a burst at forty yards. Our airmen turned and opened fire with half a drum from a Lewis gun. The German flew round and attacked again. Our men gave him another half drum, and the pilot of the hostile machine appeared to be hit. His gun was seen to swing outward and he dived and was lost to sight."

No less than fourteen aerial combats were reported in one day last week by the British War Office. In these conflicts one British plane was lost and two Germans were forced down within their own lines.

An Austrian aeroplane last week became disabled and fell into the Adriatic Sea in the vicinity of Grado. A British submarine which was in the vicinity destroyed the plane and also sank a torpedo boat which went to the rescue of the plane. The crews of both the plane and the water craft were captured.

## FRANCE

Two Zeppelins are reported to have been destroyed north of Rheims last week by the fire of French anti-aircraft guns. The dirigibles are said to have fallen inside the German lines.

An aerial attack was made on Dunkirk a few days ago by two German hydroaeroplanes. They dropped eight shells on the city, but the damage inflicted was trifling.

The contentions of the Allies in the environs of Salonica were bombarded by enemy aeroplanes on January 8 without inflicting material damage, but one of the aeroplanes was brought to earth by artillery fire.

Hundreds of Bulgarian soldiers were killed and a very large number wounded in a bombardment of Petritsi (53 miles northeast of Salonica) by a squadron of twenty-five French aeroplanes, according to dispatches received in Athens. Great material damage was also caused by the bombardment, the advices state.

An enemy aeroplane dropped three bombs on the outskirts of Luneville. None of them caused any damage. Another aeroplane of the enemy was brought to the ground near Flin. The two officers on board the aeroplane were captured near Gervilleur, southeast of Luneville.

The French Aerial League, founded by M. Barthou, a former Premier; by George Clemenceau and other prominent men, has adopted resolutions citing that as the supremacy of the air constitutes one of the elements for victory, France must do everything to gain this supremacy and maintain it. All material objections, the resolutions say, must be overcome. The League urges the immediate formation of a new flying squadron, whose work will be to carry the war into Germany. The League received a report from its technical committee, urging that the Government Aviation Service act with the League in studying ways and means for realizing the objects the League has in view.

One hundred and thirty shells were dropped on Metz by a squadron of 24 French aeroplanes on Sunday, January 23. The bombarding aeroplanes were escorted by two protecting squadrons, and during the trip the pilots of the latter division engaged in no less than ten combats with Fokkers and Aviatiks. Besides that the French planes were violently shelled along the whole of the course, but notwithstanding that the fleet returned undamaged, with the exception of one aeroplane, which was obliged to make a landing southeast of Metz. The points of attack had been mapped out for the squadron. The shells were aimed at the railway station and at the barracks.

What has been called the "aviation crisis" has passed in France. At the opening of a recent session of the Chamber of Deputies several speakers asked the government to fix a date for the discussion of the aviation questions. But it was announced that a complete explanation of all things about which questions had been raised had already been given to the committee in charge, and the Premier appealed to the Deputies, in the interest of national defense, to abandon the projected discussion, and this they agreed to do.

## GERMANY

An English biplane, carrying two machine guns, the aeroplane being a unit of an enemy squadron, was shot down near Turcoing by a German airman last week.

On the Yser fire from German anti-aircraft guns forced an enemy machine to land in the enemy lines. The aeroplane was immediately destroyed by German artillery.

During last week German aeroplanes dropped bombs on military establishments in Nancy.

There were air fights near Paschendale and Dadizelle, in Flanders, last week. Two British aeroplanes were shot down at these points, and three of their four occupants killed. A French aeroplane also was shot down near Moyenvic, in German Lorraine, about eighteen miles east of Nancy.

A German air squadron attacked enemy storage depots and an aerial port at Tarnopol, on the eastern front, but failed to do any great damage.

Germans have great confidence in the ability of a new aeroplane which will shortly be launched against England in a new series of attacks:

"A fearful fate awaits Great Britain, thanks to our new aeroplane," says the Hamburg Fremdenblatt. "While our naval men are getting their nerves and wills in condition to command ultimate triumph, we shall see the marvels of boldness shortly demonstrated by our airmen before the world."

"In regard to technical and other details of the most interesting character, which at this moment are in our possession, our lips are closed, for reasons that all will appreciate. We may, however, assure the hundreds of thousands of Germans, whose only consolation in their present depressing lives is the hope of punishing England, that destructive engines of an entirely new and immensely powerful type have been evolved for the use of our airships."

"As soon as meteorological and other conditions permit, they will do their work in London."

"Soon the destruction of the old cities of Sodom and Gomorrah will, we hope, be repeated. In these days that are following, the outraged German people will have their righteous thirst for vengeance on the stronghold of treason, lies and foul assassination quenched to satiety."

## ITALY

A squadron of four Austrian aeroplanes circled over the city of Ancona one day last week, dropping bombs. One person was killed by the attack, but there was no damage to property.

## MONTENEGRO

The ship on which Queen Milena of Montenegro, Princesses Zene and Vera and the Montenegrin officials took passage in the flight to Brindisi, was pursued all the way across the Adriatic by submarines and seaplanes. The queen has chosen Lyons as a place of temporary residence for the royal family, and she has been received in that city with manifestations of sympathy.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

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## How To Construct and Fly Model Aeroplanes

By G. A. Cavanagh  
THE CHASSIS

The previous articles dealt with the construction of a simple model aeroplane that might be launched from the hand. After having built and flown a model such as has been described, the builder might wish to equip it with a chassis, thus making it possible for the model to rise from the ground. From the following specifications the builder may make a simple chassis, which can be securely fastened to the framework of the model, heretofore described and by the use of a little extra power obtain good flights. In making the chassis, however, it is necessary to remember that it must be made strong enough to stand the hard knocks which it is sure to receive.

To make the chassis, cut two pieces of bamboo each 9 inches in length for main struts. Bend these over about one inch at one end, so that they may be fastened to the frame side members, one on either side at a distance of 12 inches from the front. Two brace pieces 6 inches in length are now cut, the ends of each piece being bent over one inch in the same direction, one end of a piece is securely fastened to a frame side member 18 inches from the front, the other end to the main strut 2 inches from the bottom. Another piece of bamboo 9 inches long is fastened from side to side to the main struts in the same place as the braces. Bend the ends of this piece over about one-half inch to enable its being fastened securely. All bamboo struts used in the construction of the chassis are approximately  $\frac{1}{8}$  of an inch in diameter.

For the rear skid cut a piece of bamboo six inches long. Curve one end so that it will run smoothly over the ground. Bend back the other end about  $\frac{1}{2}$  inch, so that it may be fastened to the rear brace of the model, as illustrated in the drawing. Next cut two 7-inch pieces of bamboo for brace struts. Bend over the ends of each  $\frac{1}{2}$  inch, in the same direction. One end of each piece securely fasten to a frame side member 3 inches from the rear. The other ends fasten to the skid about  $2\frac{1}{2}$  inches from the bottom.

For the running gear cut two pieces of wire each  $1\frac{1}{3}$  inches in length. These are fastened to the bottom ends of the main struts of the forward part of the chassis in the following manner:

Bend the wire over  $\frac{3}{4}$  of an inch from the end and securely fasten the smaller end of the wire to the bottom ends of the main struts. Next cut six pieces of  $\frac{3}{32}$ -inch bronze tubing, three of which are used on one side and three on the other. Disks may be cut from a bottle cork, and should be cut  $\frac{3}{4}$  of an inch in diameter by  $\frac{1}{4}$  of an inch in thickness. The edges being rounded off to prevent chipping. In the center of the disk insert one piece of the bronze tube, using a little glue to prevent the tube from slipping out. A second piece of tubing is slipped over the wire at the end of the main strut. Now slip on the disk and then the third piece of tubing. About  $\frac{1}{4}$  of an inch of the wire

will stick out from the end of the last piece of tubing. Bend this over as shown in the drawing, to prevent the tubing from slipping off. The ends of the pieces of tubing should be as smooth as possible to enable the wheels to revolve evenly. The second wheel is made and mounted in the same manner.

A chassis thus made will give the constructor much satisfaction. This same model may be converted into a hydro-aeroplane by the substitution of pontoons in the place of wheels. The making of a set of efficient pontoons will be described in a subsequent issue.

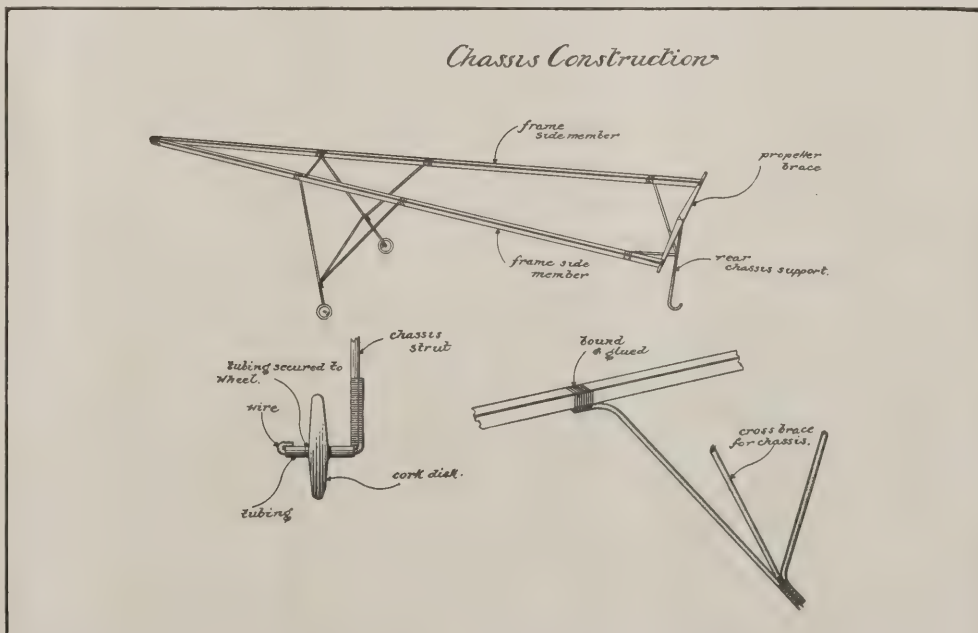
## Aero Science Club of America

Despite inclement weather many members were present at the last meeting. The possibility of obtaining permission to fly and experiment on Governors Island was taken into consideration. Mr. M. B. Sellers, acting on behalf of the club, will try to obtain the right to experiment on the island. To facilitate Mr. Sellers' efforts a petition was drafted by Messrs. Tismer and Schultz, which will be accompanied by a number of photographs, showing the results of past experiments on the part of the members. As Governors Island offers an ideal place for such a purpose, it is hoped that Mr. Sellers' efforts will result favorably.

Either on February 19th or 26th Neal MacCoull, M. E., Technical Editor of AERIAL AGE will talk to the members concerning "Aeroplane Wings." Mr. MacCoull is now writing a series of articles for AERIAL AGE, dealing with wings. The most important parts of these articles will constitute the subject of his lecture.

Mr. Frank Schober gave some good demonstrations of his two five-cylinder rotary compressed air-driven motors. The motors worked well and to the satisfaction of all present. However, Mr. Schober stated that his desire is to produce better motors, and that he will continue to experiment along this line.

(Continued on page 475)







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### A Rise

"The automatic force of inanimate objects is sometimes a wonderful thing," said the professor of aeronautics. "Yes," agreed the impecunious man, "even the humble cake of yeast can always raise the dough."

"Are aviators angels, Ma?" asked the little boy.  
 "Why do you ask me that, dear?" replied the mother.  
 "Well, because the paper says, 'Having landed the aviator found it necessary to repair his wings.'"

#### Over and Under

"Alas! death overtakes us all," sighed the aviator.  
 "Yes, in fact death is an overtaker who comes before the undertaker," amended his friend.

#### Needed

A woman who had had four stalwart air pilots billeted on her during an encampment of the army endeavored to use as little butcher meat as possible. Day after day there was served up at dinner time a scanty meal, the chief item of which was tea.



The Whole World Against Him Courtesy N. Y. World

"Ah," she said one day, pointing to a tea-leaf floating in one of the cups, "there's to be a visitor to-day!"

"Well, madam," said one of the hungry four, "let us hope it's the butcher!"

#### Same Thing

Sharp: I punctuated my tire the other day.  
 Friend: Punctuated! You mean punctured, I suppose.  
 Sharp: P'raps I do; but, anyway, I came to a full stop.

#### In Motor Terms

Caller: I suppose you can spell all the short words, Bobbie

Bobbie: I can spell a lot of big ones, too. I can even spell words of four cylinders.

#### His Grievance.

The two flying machines had almost collided and one of the pilots was expressing his opinion of the other with great freedom.

"What's the matter with you?" demanded the other. "What are you making all this fuss about? We haven't hurt you or your machine. You can't bring an action against us, you know."

"I know I can't, sir, I know I can't!" shouted the truculent one, "that's just my point."

"I hear that Richwood's daughter ran away with the pilot."

"Yes, and Richwood is nearly crazy over it."

"Well, it is hard to lose a daughter in that way."

"Oh, I don't know so much about that; but they took the machine with them."

#### Safety First

In going to war as an aviator, Vernon Castle has chosen the one method of fighting that assures the least damage to his valuable feet.

#### Aviator Wanted

"The man I marry must be a hero—brave, daring and gallant; he must have enough to support me comfortably; must have a country home, and, above all, be honest."

"That's all very good; but this is love—not a department store."

#### Back to Earth

The sick airman had just come out of a long delirium.

"Where am I?" he said, feebly, as he felt the loving hands making him comfortable. "Where am I? In heaven?"

"No, dear," cooed his devoted wife. "I am still with you."  
 —Kansas City Journal.

#### In Darkest London

Nervous lady (opening taxi door to delighted chauffeur): "To the other side of the street, please."—Punch.

#### Dutiful as Usual

Imperturbable James—"I don't know whether you would like to see them, sir, but the Zeppelins have come. Thank you, sir."

Now that some French newspapers have been distributed over parts of Germany from aeroplanes, there is a heated discussion as to which has the highest circulation.



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Managing Editor

JAMES E. CLARK

Associate Editor

G. A. CAVANAGH

HARRY SCHULTZ

Model Editors



HENRY WOODHOUSE

Contributing Editor

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igan)

Contributing Technical Editors

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VOL. II.

NEW YORK, February 7, 1916

No. 21

### Over \$250,000 Subscribed to National Aeroplane Fund

A QUARTER of a million dollars was raised in the United States in the connection with the National Aeroplane Fund during the week ending at midnight, January 31, the date on which expired Mr. Emerson MacMillin's generous offer of \$100 to every \$900 raised in connection with the National Aeroplane Fund.

Between August 1, when the offer was made, and January 1, there was raised \$89,185.

That the National Aeroplane Fund will exceed the French and German Aero Fund is the opinion of Mr. Cortland P. Bishop, vice-president of the Aero Club of America, also vice-president of the International Aeronautical Federation, and Henry Woodhouse, a Governor of the Aero Club.

Mr. Bishop said:

"I was in France at the time the French public subscription for aeroplanes was started, and I watched its progress for two years. It started in February, 1912, and it brought \$1,222,000 in two years. With this fund were bought 208 aeroplanes, mostly small, scouting machines, 75 aviators were trained, and 62 landing stations were established.

"The German Aeroplane Fund brought \$1,803,626. The purpose of the Aerial League of Germany, which started the fund, was to train within the shortest time as large a number as possible of aviation pilots to form a reserve and to encourage the general development of aviation in Germany. Following are some of the results obtained:

"The number of pilots was 230 at the end of 1912; it increased to 600 by the end of 1913; the constructors were less than 20 in 1912, they increased to 50 by 1913. The developments due to the efforts of the Aerial League led the Reichstag to pass a plan providing for an expenditure of \$35,000,000 for military aeronautics in the following five years."

Mr. Woodhouse said:

"It seems a certainty that the National Aeroplane Fund will exceed the French and German funds, in results obtained as well as in amount raised.

"The country of the Wrights and Curtiss, which gave

the first aeroplane and first hydroaeroplane and flying boat, which should be first in aviation, has been last throughout these years."

### FUNDS RAISED FOR DEVELOPING AVIATION IN THE MILITIA AND TRAINING AVIATION RESERVES IN THE PAST WEEK, BY STATES:

#### Illinois.

\$100,000.00 underwritten by the W. H. Cochrane Syndicate of Chicago, composed of representative public-spirited men of Illinois, represented by Messrs. W. H. Cochrane, Horace W. Clark, Frank T. Maloney, President State National Bank of Mattoon, and Willard A. White, Counsel for the Syndicate.

The members of the Syndicate have entered into a private agreement among themselves, in order to aid the safeguarding of our Nation's Peace, each of the hereto subscribed parties undertake and agree . . . to mutually co-operate as a UNIT *undisclosed to the general public*, TO PROMOTE WITHIN THE FIELD OF THE UNITED STATES AERONAUTICAL RESERVE OPERATION, the Program of National Preparedness.

As the first step there will be established facilities for a through schooling of aviators under the supervision of officers of the Aero Club of America and Aero Club of Illinois, these aviators to be mustered into active service in the Militia or at the call of the Army and Navy Departments.

This is only part of the substantial plan of the W. H. Cochrane Syndicate. The details of the complete plan have been submitted to the Aero Club of America and will be made public later.

#### New York.

Over \$50,000 has been raised in the State of New York. There is a contribution of \$10,000, the names of the contributors and the details about which are withheld from publication. Close to \$14,000 has been received in subscriptions from

**America Must be Given a Navy Equal to the Best. If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.**



individuals, to the General Fund. The other two subscriptions are:

Curtiss Aeroplane Company, of Buffalo, N. Y.

Course of training for one officer of the Militia of each of the forty-eight States. These courses can be taken either at the large aviation school at Newport News, or at San Diego, or Buffalo—there being Curtiss training schools at each of these places.

At \$400 per officer.....\$19,200

The Curtiss Aeroplane Company last summer presented a flying boat to the Militia of the State of New York, and a course of training for an officer and a mechanic.

**Buffalo, New York.....\$10,000**

Raised by the Aero Club of Buffalo, John M. Satterfield, president, toward a fund for the purpose and maintenance of aeroplanes and establishment of an aviation detachment in connection with the Militia.

Mr. T. Jefferson Coolidge, who gave \$5,000 last summer to pay for the training of twelve officers of the National Guard and Naval Militia of New York and Massachusetts in aviation, has contributed another \$1,250 to the National Aeroplane Fund. \$500 of this sum to go to the Aviation Detachment of the National Guard, of which Lieutenant Raynal C. Bolling is the commanding officer.

**Iowa.**

Fund raised by the Aero Club of Iowa, E. B. Brande, president, for establishing an aviation detachment in the Iowa Militia.....\$10,000

Offer from the Grinnell Aeroplane Company, of Grinnell, Iowa, W. C. Robinson, director, to train an officer of the Militia of each of the 48 States, at \$400 per officer.....\$19,200

**Michigan .....\$11,800**

Raised by the Aero Club of Michigan, of which Mr. Russell A. Alger is president, as part of a fund for the purpose and maintenance of aeroplanes and the establishment of an aerial reserve at Detroit.

**Portland, Maine .....\$9,100**

Raised under the auspices of the Chamber of Commerce of Portland for establishing the first station of the Aerial Coast Patrol System to develop the plan which the Aero Club of America has authorized Rear-Admiral Peary to organize a committee of Army, Navy, Militia and civilian aeronautical authorities and experts.

**California .....\$7,500**

A hydroaeroplane presented to Commander A. W. Woodbine of the Naval Militia of California by Mr. Clan S. Martin, of Los Angeles.

**Richmond, Virginia .....\$5,000**

Toward a fund of \$20,000 being raised by public-spirited citizens for aeroplanes, training of officers, and general equipment for the Militia of Virginia.

**St. Louis, Mo. ....\$2,600**

Raised by the Missouri Aeronautical Society, Mr. A. B. Lambert, president, toward a fund of

\$20,000 for the acquisition of two aeroplanes and training of officers, and for general equipment for the State Militia and Naval Reserves.

**Boston, Mass. ....\$2,015**

Raised by the Aero Club of New England, Godfrey L. Cabot, president, toward a fund for giving an aeroplane to the Militia of Massachusetts.

The Militia of Massachusetts will also receive \$500 from the subscription of Mr. T. Jefferson Coolidge.

**Denver, Colorado.....\$2,500**

Fund raised by the Colorado Aero Club, Charles A. Johnson, president, toward a fund of \$10,000 for the acquisition of an aeroplane for the Colorado Militia.

**New Jersey .....\$1,600**

Subscribed by public-spirited citizens for Militia Aviation. (An hydroaeroplane was presented to New Jersey by Mr. Inglis M. Upperco last month).

**Rhode Island.**

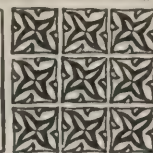
Additional subscriptions in the past week have brought the amount of the Rhode Island Militia Aviation Fund, which was started some months ago, up to \$22,000.

The sum of \$13,984 has been received at the Aero Club of America, in individual subscriptions, ranging from \$1.00 to \$500, as follows: E. M. Herr and L. A. Osborne, \$500; Elizabeth B. Dupont, \$500; William Ziegler, Jr., \$500; Samuel P. Colt, \$250; J. Kennedy Tod, \$250; Zenas Crane, \$250; Mrs. H. P. Whitney, \$250; Elbert H. Gary, \$250; Woodbury G. Langdon, \$250; Arthur C. James, \$250; F. Augustus Schermerhorn, \$250; Helen C. Postwick, \$250; Mrs. William Bayard Cutting, \$250; James McLean, \$250; Walter Jennings, \$250; Edwin F. Atkins, \$250; Charles H. Tobin, \$250; Lewis L. Clarke, \$250; Mrs. R. T. Auchmutty, \$250; Henry D. Sharpe, \$250; Lester Leland, \$250; David P. Kimball, \$250; Mrs. Herbert L. Satterlee, \$250; Ogden Mills, \$250; Earle P. Charlton, \$250; Henry R. Towne, \$250; S. Gordon Hammerslee, \$250; Coleman Du Pont, \$250; W. K. Vanderbilt, \$250; Mrs. Olivia P. Hoe, \$250; Richard H. Williams, \$250; Augustus Hemingway, \$250; E. F. Searles, \$250; Henry H. Fay, \$250; C. J. Pains, \$250; Edwin Gould, \$250; Mrs. Franklin Farrell, \$250; R. Fulton Cutting, \$250; Henry S. Kip, \$100; Mr. and Mrs. Geoffrey C. Whitney, \$100; Jules Vail, \$100; G. R. Agassiz, \$100; Benj. C. Allen, \$100; Robert Saltonstall, \$100; Eben D. Jordan, \$100; Mrs. C. M. Hinkle, \$100; Mrs. John W. Johnson, \$100; Percival Lowell, \$100; Mrs. H. L. Pilkington, \$100; F. S. Pleasonton, \$100; William G. Low, \$100; Alexander Forbes, \$100; Edward McC. Peters, \$100; Thomas A. Edison, \$100; Margaret H. Garrard, \$100; James Byrne, \$100; William Emerson, \$50; Mrs. Ballard Smith, \$50; Louise Chase Meyers, \$50; Mary Hooper, \$50; Mrs. Geo. L. Haight, \$50; Herbert M. Sears, \$50; D. Herbert Hotstetter, \$50; Howard L. Goodhart, \$50; J. W. Elliot, \$50; Mr. and Mrs. J. Barlow Cullum, \$50; William B. Walker, \$50; John L. Saltonstall, \$50; R. P. Perry, \$50; F. Lascaris, \$50; F. B. Wiborg, \$50; Thomas McKean, \$50; Mrs. Harold Brown, \$50; Guy Cunningham, \$25; Mrs. Heth Lorton, \$25; Harold Dana, \$25; Eugene Levering, \$25; Julia Tilford, \$25; F. P. Sprague, \$25; William P. Blodgett, \$25; H. Jennings, \$25; C. W. Ricker, \$25; B. Rosenwald, \$25; A. H. Kurcheedt, \$25; H. C. Bullard, \$25; L. C. Bigler, \$25; J. C. Breckridge, \$25; Mr. and Mrs. Edward B. Mears, \$25; John J. Phelps, \$25; Roger F. Hooper, \$20.





# THE NEWS OF THE WEEK



## N. Y. National Guard Aviation Detachment Makes Sixty-three Flights in Mid-winter

Lieutenant Raynal C. Bolling, commanding officer N. Y. National Guard Aviation Detachment, reports that 63 flights have been made in the month of December in spite of the storms by his men.

Lieutenant Bolling's report follows:

"During December, 1915, the Aviation Detachment continued its work with regularity, interrupted only by two or three severe storms, and made sixty-three (63) flights, some of which were of a half-hour's duration.

"At a conservative estimate, the aeroplanes of the detachment have flown upwards of 1,250 miles since training was begun on November 1, 1915. These two Gallaudet machines, which we have been flying, have proved very satisfactory. One of the members of the detachment has now made four flights alone, and several others are now about ready to begin flying alone. Some damage to the landing chassis of the 50 h.p. machine has prevented its use during most of December, so that these men who are ready to begin flying alone have had to wait until this slower machine could be repaired. Repairs will be completed within the next few days.

"I consider that the work of the detachment during the month of December proves that actual work in the field can be carried on throughout the winter, as weather conditions have been unusually bad, and the flying field has been covered with snow a large part of the time.

"The detachment could already have been recruited to its full strength without any difficulty; but instead of accepting all or a majority of the men who have made applications, I have placed a majority of their names upon a waiting list from which I am making the most careful selection. The facilities at our disposal are very meager, so that the number of men who can be given actual instruction in flying is limited. This makes it important to select the men on a comparative basis, so that the man who is merely acceptable may not fill a vacancy for which an especially qualified man may later be secured. For example, by the application of this principle I have been able to recently recruit three men who are mechanical engineers connected with two of the large automobile companies. One of these men is the chief engineer of his company. Both, by reason of their professional training and their present occupation, have expert and theoretical knowledge of gas engines, as well as practical knowledge. This is the way in which I expect to obtain the necessary expert mechanical members of the detachment.

"I am taking up with the reputable aeroplane manufacturers the possibility of obtaining some co-operation from them in this National Guard work.

"I enclose a statement of the regular expenses of the Detachment apportionable to the month of December, which are somewhat greater than ordinary by reason of repairs to the 50 h.p. machine.

"Our experience during the past two months shows that

from two to four aeroplanes are absolutely essential to the training of an aviation detachment. Minor repairs and maintenance to the aeroplanes must be kept up constantly in order to minimize the danger of serious accident. This keeps one or more of the machines out of commission a good deal of the time and seriously limits the number of men who can be trained to fly and the amount of flying they can do. Merely reducing the number of men who are being trained does not relieve the situation because the overhead expenses of the professional pilot and expert mechanic, and other fixed items, remain the same whether six men are under instruction, or twelve or fifteen."

(Signed) RAYNAL C. BOLLING.

## The New Thomas Type D-2 Very Speedy

The new Thomas Type D-2 Military tractor has been in almost daily flights over the city of Ithaca, N. Y., and surrounding territory and its behavior has pleased the officials of the Thomas Bros. Aeroplane Co. and Frank Burnside, the aviator in charge. At a recent speed trial, with a representative of the Aero Club of America as timer, an average speed of 95 miles an hour was made over a half mile course both with and against a slight wind which was blowing. The fastest lap was made at the rate of 102.5 miles per hour, which Aviator Burnside thinks will be improved upon in another trial.

The recent warm weather has turned the field into mud so that it has been found inadvisable to take out any of the machines excepting the new military tractor. Mr. Burnside has been flying under very unfavorable conditions as every landing has been practically a ploughed field test of the chassis and the gusty winds have severely tested the stability of the machine.

The new 140 h.p. seaplanes for the United States Navy have been finished and the company is now awaiting the time when the lake shall have been cleared of ice so that thorough tests may be made.

The latest Thomas Aeromotors have been running on the test block almost continuously of late and they promise to give an excellent account of themselves.

## Marblehead Aviation Section

The Marblehead Aviation Section which is to form a part of the State Militia of Massachusetts, has been organized and the incorporating papers are to be sent to the Governor for his approval. Of the twenty men who have signed the roll, sixteen are employed in the Burgess aeroplane plant and these men are enlisted as mechanics. Among the flyers will be Norman Cabot, Clifford L. Webster, G. R. Fearing, J. C. Phillips and Godfrey Cabot. Two flying machines are now ready for the aviation section at the Burgess plant.

The Thomas military tractor, type D2, which made a maximum speed of 102 miles per hour in recent tests at Ithaca.







Mr. Grover C. Loening, B. Sc., M.A., C.E., Vice-President Sturtevant Aeroplane Co., former aeronautic engineer of the U. S. Army, author of "Military Aeroplanes," and other important technical works, who was awarded the Aero Club of America's medal of merit recently for meritorious development in steel aeroplane construction.

#### Niles Gets Wonderful Reception in Japan

The issues of the *Japan Times*, which are just to hand, bear emphatic testimony to the excellent reception which Charlie Niles is being accorded on all his stop-off places in Japan. "Tokyo, and for that matter Japan," says the *Times*, "may be said to have seen flying for the first time yesterday afternoon. The capital had witnessed many aviation displays, but compared with what Mr. Charles Niles, the famous American flyer did, all previous exhibitions were merely elementary. The public was given to understand that it would be treated to some sensationalism, but very few could have expected anything like the display which was given. In both his flights the distinguished visitor from first to last may be said to have flirted with death, but he did the courting with such grace and confidence that there was never any element of uneasiness among the tremendous crowd. The crowd which saw and marveled at the performance was probably the greatest that has ever been packed into the Aoyama Parade Ground. It was far bigger than that which recently attended the coronation military review."

It was variously estimated that between 200,000 and 250,000 people saw the flights, and so enthusiastic were they in their demonstrations that the military had to be called upon to assist the police in keeping the track clear.

General Nagaoka accompanied Mr. Niles to the aerodrome, and the exhibitions were witnessed by Prince Higaski Kuni and other members of the royal household.

When Mr. Niles finishes his tour in Japan, he plans to visit China, the Philippines, India and Australia.

#### First Aeronautical Lecture at West Point

On Saturday evening of last week, G. Douglas Wardrop, Managing Editor of *Aerial Age*, delivered an illustrated lecture at the United States Military Academy, at West, on "The War in the Air," before the entire cadet body, instructors and residents of the garrison. In his introductory remarks, Captain G. C. Carter, Adjutant of the Coast Artillery Guards, called attention to the fact that it was the first lecture dealing with any phase of aeronautics that had ever been delivered at West Point Academy, notwithstanding the tremendously important part which aircraft have played, and will play, in the European catacyclism.

Mr. Wardrop, in the course of his talk, enlarged upon the lack of aerial preparedness in this country, pointed out how the Navy had maneuvered without the aid of a single seaplane during the past summer, and showed that in Army aerial equipment, we were far behind, not only the first class nations, but some of those nation's colonies. The cadets and officers were greatly interested in the subject matter of the address, and took occasion to ask many questions concerning the fourth arm of modern defense.

#### Aero Engine Mechanism Discussed

In a two-volume edition of "Valves and Valve Gears," just from the press of John Wiley & Sons, Franklin De Ronde Furman, M. E., Professor of Mechanism and Machine Design of Stevens Institute of Technology, has devoted a chapter of the second volume to "aeroplane engines." The construction of the Wright, Curtiss, Salmson, Gnome and Gyro are considered. The matter on the gasoline engine includes an original method of using the sinusoidal diagram in laying out the sleeve valve in connection with the Lyons-Wright engine, and of analyzing the kinematic action of revolving engines, such as the Gnome and Gyro.

Throughout the book, the subject of valves and valve gears has been treated from the standpoint of mechanism rather than that of power, and the chief aim has been to tell in *particular*, instead of in general, *just how* the engine or motor is regulated; also to tell how the valves and valve gears may be laid out, with due regard for the laws of mechanism, to give the desired control of the steam or gas or other operating agent.

The chapter on aeroplane engines, is one which is full of suggestion and instruction for the student of this type of power plant.

#### Aviator von Figyelmessy Orders a Sloane

Holderman von Figyelmessy, the well-known exhibition flyer has placed an order with the Sloane Manufacturing Co. for a Type "M" 90 h.p. Tractor Biplane. This machine will contain many of the features that made the performance of the Sloane Type "H" so remarkable.

The speed variation of this outfit will be from 35 to 75 miles per hour. It will carry pilot and passenger and can be equipped as a sea-plane. The Sloane standard four-wheeled landing gear will be supplied.

#### American Aviators Honored in France

On their return to France, William Thaw, Elliott C. Cowdin and Norman Prince, the Americans, were received at the aviation headquarters by M. Besnard, Aviation State Secretary, who said to them:

"In the name of France I wish to express the national gratitude and appreciation of your efforts and inform you that steps will be taken immediately to enroll all American aviators here—some twenty altogether—in one Franco-American Aerial Squadron."

The veteran aviators were accompanied by Lieut. Prince's brother and by Robert Soubiran of New York, who will enter an aviation school to fit themselves for service in the French-American Aviation Squadron.

M. Besnard further declared that he would order every encouragement given to American flyers, and especially to learners, at the Pau Aviation School.

The meeting was arranged by Eugene Boggiano, a fellow-passenger of the airmen on the Rochambeau, after a trip to America as special correspondent of the *Petit Journal*. Through his agency they were also presented to M. Berthelot, chief of the permanent staff at the Ministry of Foreign Affairs, and to former Foreign Minister Pichon, director of the *Petit Journal*, who thanked them in the name of the French press.



### Burgess Constructing Twin-Tractor Type Machines.

The rise of the twin-tractor as a fighting machine abroad has led to the designing of a number of craft of this type by W. Starling Burgess, of the Burgess Company, at Marblehead, Mass. Several machines are now under way, and their construction will be completed at an early date. In general appearance the new Burgess craft resembles the French Caudron, although it is equipped with considerably more power. Two engines of 150 horsepower each are mounted one on either side of the center section, and either will keep the craft in the air. For securing this result the two are entirely independent, each driving its own tractor-screw, and each operated by a separate control from the pilot's seat.

Mr. Burgess has aimed chiefly at a weight-carrier and the total useful load is estimated at 1,000 pounds, while nearly an equal amount of fuel and oil will give a continuous flight of four hours. The total lift, consequently, will approximate one ton. Rapidity in climbing, rather than speed, has been another objective, owing to the necessity for escaping the enemy's anti-aircraft guns.

On the center section of the nacelle is placed, the pilot sitting behind the gunner. Forward of the latter's seat is mounted the gun, giving an arc of fire of nearly a half circle. As the allowance for operator and passenger is 350 pounds, it will be seen that the armature may take up a total of more than six hundred pounds. When desired, therefore, the Burgess "twin" will be able to carry heavier metal than a machine gun.

In raiding six bombs of more than 100 pounds each may be transported, or a larger number of lesser weight. As the speed called for in the design is 70 miles per hour, it will be seen that positions of an enemy at nearly 150 miles distance might be attacked under favorable conditions. With a lesser load of explosives, of course, additional fuel could be carried for extending the zone of operations.

### Aeroplanes in the Otay Valley Flood District

In an attempt to rescue persons marooned by the flood in the Otay Valley, near San Diego, Cal., Aviator Max Fleischmann made a tour of the devastated district in his aeroplane, but though he saw several bodies he failed to find a living being. Aviator Raymond Norris circled over the raging torrent in the valley and saw several bodies going down stream.

### Eden School of Aviation in Florida

Frederick C. G. Eden, who is conducting the Eden School of Aviation at West Palm Beach, Florida, has instituted a regular service from West Palm Beach to Miami, about 70 miles. The trip is made each Wednesday, and from all indications the West Palm Beach-Miami aerial route is going to be very popular.

Although the season has not yet reached its height, Mr. Eden has thus far carried about fifty passengers on flights along the beach, and the prospects of a busy season are excellent. Most of the passengers carried have been ladies. Among the prominent persons who have made flights are Mr. Bayard Colgate, of New Jersey; Mr. and Mrs. Hall and Mr. Paton, of New York; Mr. Dupont, the powder manufacturer, and Mr. Failey, the well-known yachtsman.

Malcolm Humphreys, of Morristown, N. J., who is anxious to join the Naval Militia, and Mr. Ivan P. Wheaton, of Amsterdam, N. Y., are taking courses in aviation in the

Eden School, and many other pupils are expected to enroll in the near future.

Some time during the season Mr. Eden will attempt a flight from West Palm Beach to Havana, and he sees no reason why the feat cannot be accomplished without difficulty.

Mr. Beryl H. Kendrick is also at West Palm Beach with his aeroplane, carrying passengers, and he and Mr. Eden have engaged in friendly races on the wing.

The weather at West Palm Beach is wonderful, there being hardly a day when flying is not possible. Interest in aviation is increasing apace, and it is expected that in the near future several of the wealthy men sojourning there will purchase flying boats.

### Turning Out Aerial Motors

Prior to the breaking out of the war there was little in market conditions to encourage manufacturers of automobile engines to develop aviation motors, but with the coming of the war conditions changed almost over night, and now practically all automobile factories are turning out aeroplane engines.

The Gnome Company, which formerly secured a very large part of the Italian business, has a big factory in Turin, and is devoting itself wholly to government orders for rotary cylinders and fixed eight-cylinder all-aluminum water-cooled aerial motors.

The Fiat Company is producing a six-cylinder vertical water-cooled engine with inclined overhead valves, and a single overhead camshaft. The cylinders are of steel, separate, with a steel water jacket for each pair. This Fiat motor resembles that built in France by Renault, and the Lorraine-Dietrich.

Lancia is building twin sixes with horizontal valves.

Spa is building eight-cylinder V-motors, ten-cylinder Anzani motors and six-cylinder vertical type with steel cylinders, sheet metal jackets and overhead valves.

The Diatto Co. is building the Bugatti aviation motor, six steel cylinders welded together and surrounded by a copper water jacket. There are four vertical valves per cylinder with a patented mechanism by which a single cam operates direct on a pair of valves.

The Chirbirri Company, a small concern, is doing much experimental work, and herewith is given an illustration of their 16 fixed cylinder aviation motor.

Isotta-Fraschini is building both six and eight-cylinder vertical, water-cooled aviation motors.

The Nazzaro Company is building the Anzani type.

Though the Italian makers are by no means strangers to the use of aluminum pistons, there is comparatively little use of aluminum pistons. The Fiat Company has conducted a series of experiments with aluminum alloy pistons, and is using them on all six-cylinder aviation motors having a bore of 4.7 in.

### They Know

The United States Navy Department has decided upon the construction of a dirigible of the Zeppelin type, and its construction will be begun at the navy yard in Portsmouth, N. H., on December 15th. The airship will be 175 ft. long, 50 ft. in diameter, and will cost \$30,000. The engineers who will be in charge of the work are of the opinion that it can be completed in about a month.

[We are not.—Ed.]—*London Aeronautics.*

Nor are we.

The new Burgess 140 h.p. Pusher B-plane, as supplied to the British government, which we are enabled to reproduce through the courtesy of "Aeronautics" (London).





## NEW HOLDERS OF PILOT'S CERTIFICATES



Top Row—Lieut. Ralph Royce, student at Signal Corps Aviation School, North Island, qualified in Martin tractor, Curtiss O. X. motor; William Hargrove Chism, student at Wright School, Augusta, qualified on Wright Model B; Lloyd Samuel Breadner, student at Wright School, Augusta; Roderick McLean Weir, British, qualified at Wright School. Second Row—Corporal Ira Oles Biffle, Signal Corps Aviation School, qualified on Martin tractor, Curtiss O. X. motor; Walter S. Penty, British, Christofferson School, Alameda, Cal., qualified Curtiss type biplane, Hall Scott motor; James Alexander Shaw, British, Wright School, qualified on Wright Model B; Harold B. Smith, British, Christofferson School, Curtiss type biplane. Third Row—Sergt. Austin A. Adamson, Signal Corps Aviation School, Martin Tractor, Curtiss motor; Patrick Sylvester Kennedy, Canadian, Wright School; Captain W. L. Patterson, Signal Corps Flying School, Martin tractor, Curtiss motor; Lieut. Roy Stuart Brown, Signal Corps Aviation School, Martin Tractor, Curtiss motor. Bottom Row—Lieut. Harrison H. C. Richards, Signal Corps Aviation School, Martin tractor, Curtiss motor; Roy Teernstra, Dutch, Christofferson School of Aviation, Curtiss type biplane, Hall Scott motor; Lieut. John F. Curry, Signal Corps Aviation School, Martin tractor, Curtiss Motor; Gerald Atkinson Magor, Wright School, Wright Biplane Model B.



## THOMAS 1916 AEROMOTORS

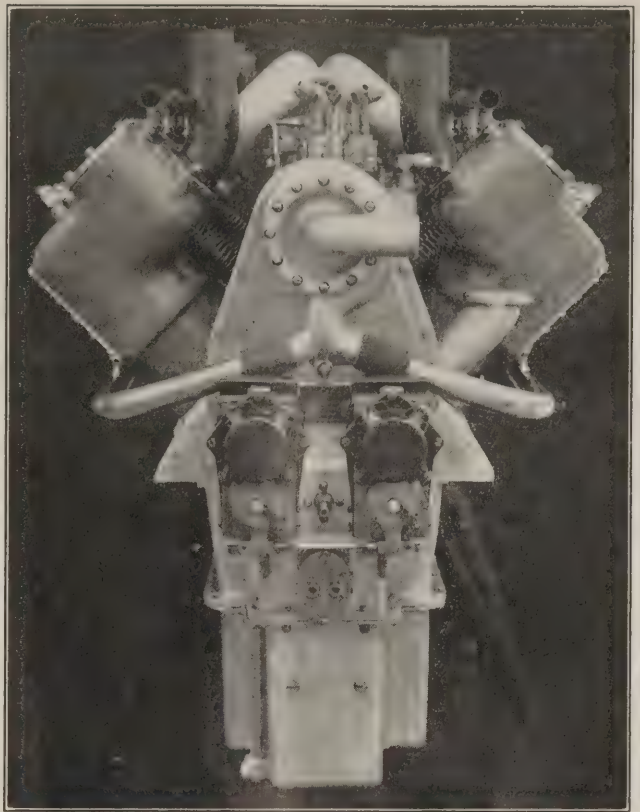
**T**HE Thomas 135 H.P. Aeroplane Motor—the power plant used on the D 2 Type Military Tractor which recently smashed all American speed records by showing an average speed of 95 M.P.H. with a maximum speed of 102 M.P.H., is here shown with added improvements over that illustrated in our issue of November 1st.

It is now equipped with two eight cylinder magnetos of Splitdorf "Dixie" type instead of the one single installation formerly used. They are located side by side as shown in the cut, in a position close to the rear end of the crank shaft where they are readily accessible. Both are driven at crank shaft speed. Although the original idea in fitting two magnetos was to increase the ignition reliability 100% it is gratifying to know that an increase in power has also resulted.

As it is often desirable to provide auxiliary means for cooling oil in the base chamber or sump, especially in warm weather, a comprehensive oil cooling system operated entirely independent of the lubricating system is now fitted. It consists of independent gear pump which takes oil from the oil sump at a two-gallon level and passes it through cooling coils which may be located to suit the aeroplane designer, and returned to the oil sump again. To serve as a tell-tale this oil may be passed through an oil gauge under the eye of the pilot and so warn him when the two-gallon level has been reached. This tell-tale will also prove reliable in case of flights of long duration, where an oil supply-tank is necessary, by warning him when to add oil to the sump.

A gasoline gear pump which is located below the level of the crank shaft, where it is always primed, is an addition much appreciated by aeroplane manufacturers. This does away with the small air propeller-driven gear pump, which was formerly used for delivering gasoline to an auxiliary tank in order to gain sufficient gravity for the carburetor.

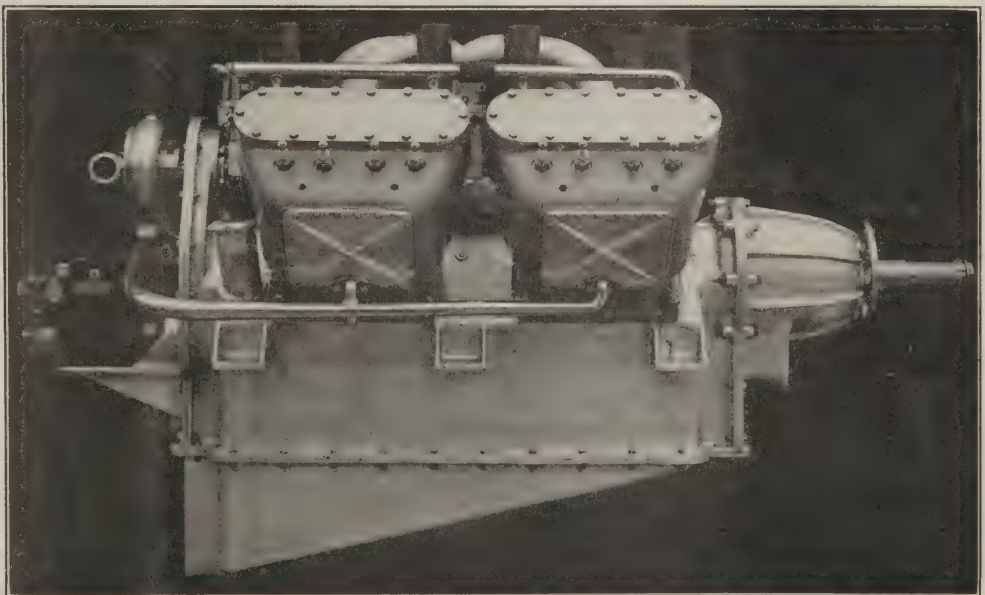
The self-starter which is of the combined gasoline and air type is located as shown in the illustration between two banks of cylinders and is driven at crank shaft speed by the same shaft that operates the water pump. Lubrication is taken care of automatically by a feed pipe in connection with force feed lubrication system of the motor. In the application of this starter, which is regular equipment on all Thomas motors, no drive shaft is exposed, thus eliminating all chances of oil leakage.



End elevation of Thomas aeromotor, showing self-starter, double magnetos, Tachometer drive, stabilizer drive, gasoline and oil cooling circulating pumps.

Aluminum pistons of a special alloy are now used as standard in place of cast iron, the connecting rod and piston assembly weighing but  $3\frac{3}{4}$  pounds, as compared with 5 pounds in the original motor. The direct result of the use of aluminum has been a notable increase in sweet running, there being almost an entire absence of vibration. Complete with carburetor, two magnets, self-starter, propeller bolts and front plate, but without propeller and radiator, the weight of the equipment is six hundred pounds.

Side elevation Thomas 135 H.P. Aeromotor, showing two sets of spark plugs per cylinder.





# AEROPLANE WINGS

By NEIL MAC COULL, M. E.

(Continued from page 453)

## CHARACTERISTICS

It is of course desirable to have the greatest possible "efficiency"—that is, the ratio of lift to drag should be as great as possible. This ratio may be read from Fig. 2 by means of lines radiating from the lower left-hand corner to the scale at the top. It will be noticed that there is no one wing which has the highest ratio of lift to drag for all angles of incidence. Hence it can not be said that any one wing is "the best" wing because different wings will probably be best for different types of aeroplanes. These curves lead one to conclude that wings of deep camber are best for high lift coefficients, and thin wings are no better, if as good, at these angles as those that are relatively thick. For small lifts head resistance is considerably reduced by using wings of small camber. Thickness seems to have but little effect on the characteristics up to about 9°, provided that the average or mean camber is not varied. This was found to be true of wing No. 31 even when its thickness was doubled. It was not the case, however, when the camber of the lower surface was maintained, all the thickness being added by increasing the upper camber.

It would seem, then, that if some type of variable camber wing could be made practical in construction it would be possible to have a wing with the valuable qualities of high efficiency at both high and low coefficients of lift, which would considerably increase the speed range of an aeroplane.

## CHOICE OF A WING.

In the choice of a wing there are two important considerations to be kept in mind: sufficient depth of wing for the use of deep spars, and speed range. The importance of using deep spars is due to the fact that the deeper the spar the stronger it will be for its weight, and the less the amount of external bracing that is required by wires, turnbuckles and struts, all of which produce considerable wind resistance. In regard to the second requirement, all wings show a maximum lift at an angle of incidence somewhere between 15° and 20°. At angles greater than these the lift falls off. Now the lower the speed of an aeroplane the greater must be the coefficient of lift for a given wing area, and it is obvious that horizontal flight is impossible below the speed corresponding to the maximum coefficient of lift. For wing No. 33 this coefficient is 0.00332, and if it is desired that an aeroplane weighing 2,000 pounds be able to fly at a minimum speed of 33 miles per hour with this wing the wing area must be (from equation 1),

$$\frac{2,000}{0.00332 \times 33 \times 33} = 552 \text{ sq. feet.}$$

In this way the area required for an aeroplane of any weight may be computed for any wing section provided that the minimum possible speed is assumed\*. The minimum speed is a very important matter, for at the present time the greatest dangers to an aeroplane are not in flying, but in the run on the ground just before or after a flight, and the possibilities for accident increase rapidly as the speed necessary to leave the ground is increased.

If this same aeroplane is required to make a maximum speed of 100 miles per hour, equation 1 and Fig. 2 show that it will do so while flying at an incidence of almost -3°. This

exceedingly small angle is not only quite inefficient ( $\frac{L}{D}=3.6$ )

but it is dangerous as well. It is so near the angle of zero lift that a very slight vertical oscillation of the aeroplane or fluctuation of the wind will produce a variation of the lift from the value necessary to support the aeroplane, to zero or even a negative value tending to force the machine down. There is an additional destabilizing effect caused by the fact that in the region of zero lift the center of pressure moves very rapidly from a point near the center of the wing to the rear edge. But this is partly compensated by the sudden

movement of the center of pressure to the front edge when a negative lift occurs, which tends to restore an angle of incidence causing a positive lift. If as great a speed range as possible is desired, it is well to examine the movement of the center of pressure, not only to the angle of incidence required for maximum speed, but also to angles 1° or 2° less. It is because of the danger of flying at very small angles, and the poor efficiency of most wings at these angles, that aeroplanes must be designed with such small surface that the minimum speed must be increased above 50 miles per hour when very great maximum speeds are desired.

## CENTER OF PRESSURE.

Fig. 4 shows the movement of the center of pressure of most of the wings of Figs. 1 and 3 between the angles of incidence ordinarily used. It will be observed that a large majority of the wings have very similar curves. As the angle of incidence is reduced from 90°, the center of pressure moves forward until it is about one-third of the distance from the leading edge. It then moves backward as the angle is increased, approaching the rear edge as the angle approaches that of zero lift. There is of course no center of pressure when there is no lift. As the angle is still further reduced, resulting in a negative lift, the center of pressure is found to be near the leading edge, from which it moves to a point half way back as the angle approaches 90°.

Now in order that a wing shall be inherently stable, the center of pressure should move forward as the angle is reduced to that of zero lift, and vice versa. Hence these wings, with the exception of Nos. 1 and 32, will be unstable at all angles at which they are commonly used in flight, and this must be compensated by a suitable tail. All of these wings if inverted, i. e., used with the concave side up as is the case with such circus stunts as flying upside down, are stable. Flat wings, too, and wings with a pronounced upward curvature at their trailing edge, are stable, having no backward movement except in the region of negative lift. Such wings have shown neither good efficiency nor high maximum lift in tests made so far, and are not used in practical aeroplanes. A compromise, such as wing No. 32, between the above and the conventional wing shape, seems to be quite promising. Not only has this wing characteristics which are excellent for speed range, but it is much more stable than any other of the wings shown except No. 1, which is too inefficient to be of use except in the control surfaces.

In making use of the curves of Fig. 4 it will not be worth while to split hairs for accuracy, as the curves themselves are not the last word in accuracy. It was found in plotting them that it was not possible to draw them so as to pass through all the points given by Eiffel's data, but they are so close to true values that their use will involve no appreciable errors.

WING TYPES.—Wing No. 1 is not shown in Figs. 1 or 3 because it is simply a rectangular plate, the same size as wings Nos. 12, 31, etc., and one-eighth inch thick. The edges were not sharpened, which accounts for a considerably greater drag at zero lift than that caused by skin friction alone, there being an area of over four square inches offered to the wind by the front edge of the model. However, this is very similar to the condition met in the tail surfaces of a full-sized aeroplane. In making calculations for these parts it is necessary, of course, to make corrections for aspect ratio, as previously mentioned.

Wings Nos. 12 and 35 are of interest because of their high efficiencies at a certain small part of their range. The former was used by Maurice Farman and the latter by Commandant Dorand. Both are too thin for good spar room.

Wing No. 32, as previously remarked, has a very high efficiency at low angles, combined with a good lift even at 15°, and is much more stable than the other wings.

(To be Continued)

\* Difficulties arise in flying at an angle corresponding to the maximum lift coefficient, which will be dwelt on later. It is not usually possible for a pilot to control his aeroplane at speeds corresponding at angles greater than 8° to 12°.



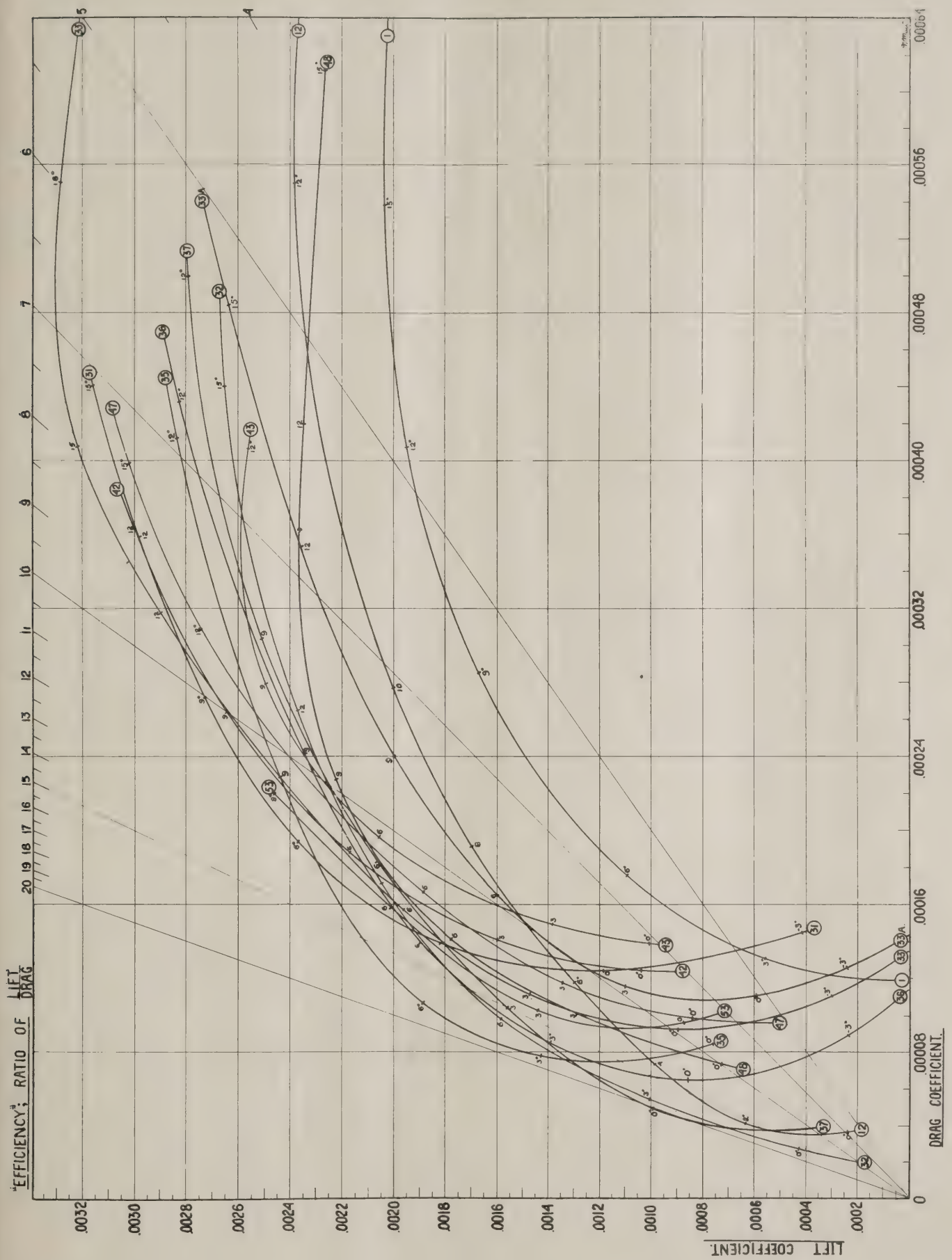


Fig. 2





# FOREIGN NEWS

By JAMES E. CLARK



## BELGIUM

Northeast of Nieuport a German seaplane was engaged in battle by a British machine of the same type, and the German was forced to descend.

A French squadron, composed of seven machines, dropped a score of bombs on the enemy's commissary headquarters at Middelkerke.

## BULGARIA

A dispatch from Salonica says that French airmen have successfully bombarded three Bulgarian positions—at Monistar, Ghevgheli and Petrich.

## FRANCE

Sunday seems a favorite day for the aerial attacks of the Germans on the cities of the Allies that are far removed from the firing lines. The Belgium King recently was in danger of death from aerial bombs the attack having been made as he was leaving church with the Queen. England has had memorable Sundays. On Saturday, January 29, a Zeppelin appeared over a section of Paris at 9:20 o'clock and threw bombs from a height of 14,000 feet, which killed twenty-four persons and injured twenty-seven. In this last attack the invader was favored by a fog which rendered the searchlights and the anti-aircraft useless. The bombs were thrown without any particular aim. When the presence of the Zeppelin became known firemen dashed through the streets sounding a warning with trumpets, street lights and all illuminations were extinguished, and thirty airmen mounted to attack the invader. The raid lasted only a minute and a half. One of the defending aeroplanes fired twenty-five shots from a rapid-fire gun and the Zeppelin proceeded westward pursued by five aeroplanes. On Sunday night, Paris was again alarmed by a Zeppelin which passed over at 10 o'clock.

In addition to bombardment from long range guns, Dunkirk was attacked on the morning of January 25 by two aeroplanes which appeared over the city at 6 o'clock and dropped a number of bombs.

On Sunday night, January 23, French airmen bombarded Anizy, Laon and Nogent l'Abesee.

## GERMANY

The new German dreadnaught of the air, which has been perfected with all the secrecy that has been possible, has at last been encountered in the air by a French aviator, who described it as a "huge monster making a terrific noise, much more than a Zeppelin." He escaped by virtue of having a speedy machine, but even yet marvels how he avoided the terrific gun fire of the big craft. France has had the big machine under its eye for a long time, but for the benefit of its spies it has kept its information to itself, but the other day a government official described it:

"The new German air dreadnaughts," said this Frenchman, "are fitted with a total motor power of 700 horsepower in four motors—two of 220 horsepower each and two of 130 horsepower each. They attain 110 miles an hour. As well as being ironclad they carry four machine guns, bomb throwers and many other offensive devices.

"Their size and carrying capacity is immense. Measuring 75 feet across the wings and 28 feet in depth, they will carry twenty-seven men or their equivalent weight in munitions. They have one drawback; their altitude limit is about 6,000 feet.

"Every airship has what is known in aviation slang as its roof—a height which it cannot exceed. Now these new German machines have the roof of 6,000 feet, and cannot compare with our planes either in speed or mobility. So we can view the prospect of encounters with the German air dreadnaughts with confidence."

The big machines are for the purpose of patrolling the air and protecting scouting aeroplanes while making observations.

Allied airmen made an attack on Freiburg, the principal city in the Grand Duchy of Baden at 10 o'clock on the night of January 27. Eighteen bombs of about 310 pounds each and ten bombs of about 180 pounds each were thrown at the railway station and the military establishment, causing important damages. Celebrations in observance of the Emperor's birthday were in progress, and the city theatre was crowded, but the theatre crowd remained calmly indoors until the raid was over.

Rebutting the statements made in the British House of Commons concerning aerial losses, printed elsewhere on this page, an official statement issued at Berlin says that "since October 1 sixteen German aeroplanes have been lost on the west front. Seven of these were lost in air engagements, eight were shot down from the ground and one is missing.

"In this same period the French and British lost sixty-three aeroplanes, forty-one of which were lost in air engagements, eleven were shot down from the ground and eleven landed within German lines.

"These figures comprise only absolutely certain cases in which the enemy's aeroplanes fell into German hands."

"A German aeroplane squadron," says an official German bulletin, "attacked the military establishments and aerodrome at Nancy and the factories of Baccara. A French biplane fell with its occupants near Benoit, northwest of Thiaucourt. The machine and crew were undamaged."

Two German air squadrons, which raided Nancy, dropped 150 bombs on the town and the fortress. In this raid Lieutenant Boehme, as the name is announced in the German bulletin, but Lieutenant Boelke, as the English papers have it, fell to the ground near Ensisheim, Alsace, and was instantly killed. This aviator is the man who was mentioned in the Berlin official report of January 13 as having brought down his eighth enemy aeroplane. With his fellow aviator, Lieutenant Immelmann, he had received the highest of German military decorations for his bravery. When the French machines approached Freiburg, Boehme engaged them single-handed and killed the pilot of one aeroplane and the observation officer of another. Both aeroplanes were forced to land, and the surviving occupants were made prisoners.

German artillery brought down one of two Allied aeroplanes, which appeared over the German lines, says a Berlin dispatch. A German battleplane engaged the remaining enemy machine at an altitude of 3,000 feet and disabled it after an exciting combat. The German machine landed soon after its adversary had been brought down, and the German pilot rushed to the two British officers and shook hands with them. Both British officers had been wounded, one had a slight wound on the head, the other three bullets in the shoulder.

The British pilot, who spoke German fluently, declared, after learning that he was a prisoner:

"I am not ashamed, as it is Immelmann who brought us down."

Whereupon the German informed him:

"Well, this time it was only Boelke."

(Boelke's death has been announced in a previous dispatch telling of the raid on Nancy).

## GREAT BRITAIN

A fleet of six or seven Zeppelins passed over the Eastern and Northern midland counties of England, Monday night, dropping a number of bombs. Fifty-four were killed and 67 were injured.

A German newspaper claims that in the recent air raid on Dover thirty-nine persons, including one officer and twenty-four soldiers were killed, one transport was sunk, and several railroad cars loaded with provisions were destroyed. The same paper declares that one of the torpedoes fell on a deposit of mines which were exploded doing great damage. The British aeroplanes were not ready in time for defense, according to the German version, while the British announcement is to the effect that the invaders were chased away. Harold J. Tennant, under secretary for the war, announced in the House of Commons that the provision for attacks from the sky in the vicinity of the Strait of Dover was efficient. The government had aeroplanes equal in speed to those of the enemy, and equipped with guns which could be fired in the direction in which the aeroplane which carried them traveled.

In expectation of a resumption of the Zeppelin raids, the London police last week issued the following warning:

"The increase in offensive protection against hostile aircraft recently provided in the metropolitan district makes it more necessary that the public on the occasion of air raids take cover, so as to be sheltered from falling fragments of shells."

The Wilson liner *Carlo* was recently attacked in the vicinity of Dover by an aeroplane, which threw a number of bombs at this ship and at others in the vicinity. It failed to inflict serious damage on any of them.

Harold J. Tennant, Parliamentary under secretary for war, announced in the House of Commons a few days ago that in the four weeks preceding that date there had been lost on the Western front fourteen British aeroplanes and nine or ten German machines had been brought to the ground. In the same period, Mr. Tennant said, the British had employed 138 machines, while the German had used approximately twenty. The number of British aeroplanes which had crossed the German lines was 1,227, while 310 German machines had crossed the British lines. Aerial battles, Mr. Tennant said, had occurred over and behind the German lines, and owing to the westerly winds German machines, if hit, planed down to their own lines, which the British were unable to do.

Squadron Commander Richard Bell has received the Victoria Cross and Flight Sub-Lieutenant Gilbert Formby Smylie has received the Distinguished Service Cross in recognition of acts of bravery, which are described in an official circular as follows: "On November 19 these two officers carried out an air attack on Ferrijik Junction. Flight Sub-Lieutenant Smylie's machine was received by heavy fire and brought down. The pilot planed down over the station, releasing all his bombs excepting one, which failed to drop. Thence he continued his descent into the marsh. On alighting he saw the one unexploded bomb, and set fire to his machine, knowing that the bomb would ensure its destruction. He then proceeded toward Turkish territory. At this moment he perceived Squadron Commander Davies descending, and fearing that he would come down near the burning machine and thus risk destruction from the bomb, Flight Sub-Lieutenant Smylie ran back and from a short distance exploded the bomb by means of a pistol bullet. Squadron Commander Davies descended at a safe distance from the burning machine, took up Sub-Lieutenant Smylie in spite of the near approach of a party of the enemy, and returned to the aerodrome, a feat of airmanship that can seldom have been equalled for skill and gallantry."

Since the war broke out the British government has, it is claimed, discarded about \$7,000,000 worth of aeroplanes, motors and accessories. Rather than risk the lives of the aviators in machines which have developed a defect that under stress may result in an accident, the government, it is claimed, mercilessly dissembles and scraps aeroplanes that on a superficial examination appear to be trustworthy.

## SERBIA

Monastir, in southwestern Serbia, was attacked by a fleet of 45 French aeroplanes last week. Their load of bombs was directed against the ammunition depots, the quarters of the general staff and the railroad station. Many of the bombs were, it is claimed, launched with deadly accuracy and much damage was inflicted on the town. Over 100 persons are said to have been killed.

## TURKEY

The Turkish Army Headquarters announces that on January 25 a hostile monitor, which was firing shells in the direction of Akbach, was silenced by a Turkish aeroplane, which threw two bombs against the monitor.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
115 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
491 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1717 Concord St., Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 138, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**SPRINGFIELD MODEL AERO CLUB**  
Springfield, Mass.  
**MILWAUKEE MODEL AERO CLUB**  
455 Murray Ave., Milwaukee, Wis.  
**CONCORD MODEL AERO CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**PLATTSBURG MODEL AERO CLUB**  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### The La Tour Flying Boat

One of the most notable results of the National Model Aeroplane Competition of 1915 was the establishing of a new world's record for flying boats. Considering that the model flying boat is a difficult type of model to construct and fly, the establishing of this new world record of 43 seconds is remarkable. Credit for this performance is due Mr. Robert La Tour of the Pacific Northwest Model Aero Club, who designed, constructed and flew the model flying boat, which is herewith described and illustrated.

The frame is made of laminated spruce 40 inches in length, made of two strips glued together. They are  $\frac{3}{8}$ " x  $\frac{1}{8}$ " at the center tapering to  $\frac{3}{16}$ " x  $\frac{1}{8}$ " at the ends. The cross braces are of split bamboo and are fastened to the longerons or frame side members by bringing them to a wedge at the ends and then inserting them into slots in the sides of the longerons and are finally drilled and bound to the latter. The rear brace is of streamlined spruce  $\frac{1}{4}$ " x  $\frac{1}{8}$ ", this butts against the longerons and is bound to them. The

propeller hangars, as shown in the drawing, are made of brass.

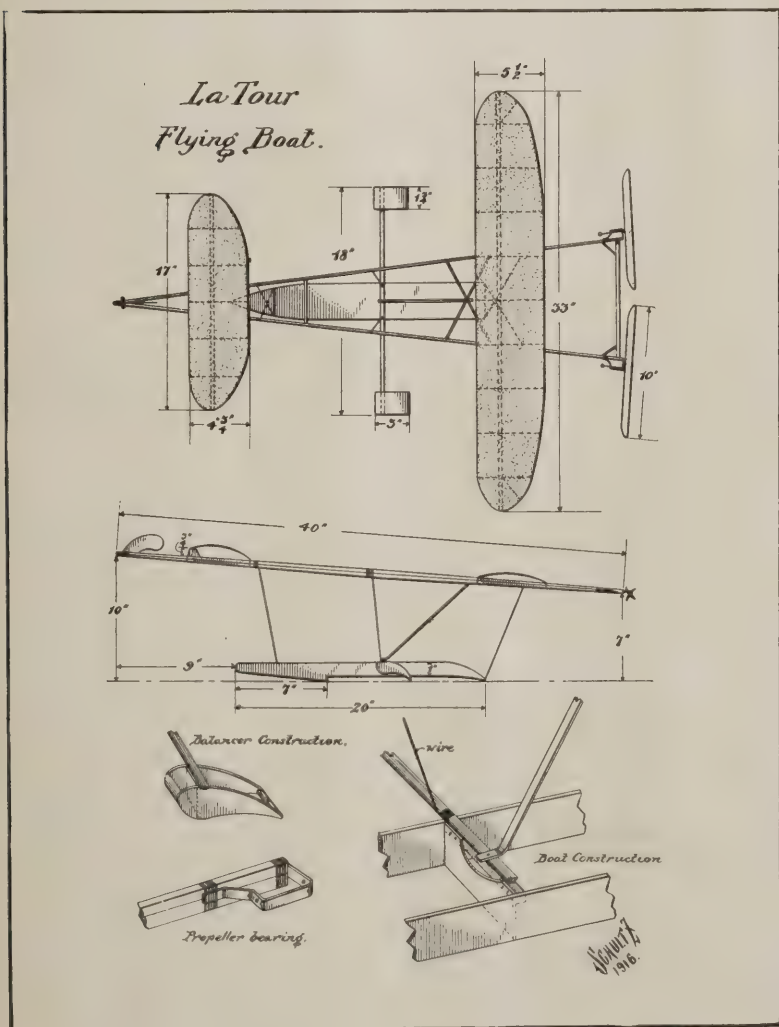
The propellers are 10 inches in diameter with a 19-inch pitch. These are carved from a block of Alaska Cedar  $\frac{1}{4}$ -inch wide by  $\frac{3}{4}$ -inch thick. Of course the propellers may also be made from white pine. To turn the propellers 15 strands of  $\frac{1}{8}$ -inch flat rubber are used.

Bamboo about  $\frac{1}{16}$  of an inch square is used to obtain the outline of the planes. The main plane has a span of 33 inches with a chord of  $5\frac{1}{2}$  inches. Split bamboo is used for the making of the 9 ribs. The wing spar is of spruce  $\frac{3}{16}$  x  $\frac{1}{8}$  and is fastened below the ribs as shown. The elevator is constructed in like manner but has a spread of only  $17$ " x  $4\frac{3}{4}$ " and has only 5 ribs. A block  $\frac{3}{4}$ -inch high is used for elevation. Both planes have a camber of  $\frac{1}{2}$  inch and are covered on the upper side with silk doped with ambroid varnish and a few coats of white shellac.

The boat is 20 inches long, 3 inches in width and is shaped as shown. The slip is  $\frac{1}{2}$ -inch deep and is located 7 inches from the bow. The rear end is brought down steeply to avoid the drag of the water on this point when the boat is leaving the surface of the water. Spruce  $\frac{3}{64}$ ths of an inch thick is used for the making of the sides, but the cross bracing is of slightly heavier material, there being six braces used throughout. The rear brace is much heavier in order to withstand the pull of the covering and to receive the ends of the wire connections. The outriggers or balancing pontoons are constructed of the same material as that of the boat and are connected together by a spruce beam 18 inches long,  $\frac{1}{2}$  inch wide by  $\frac{3}{16}$ ths of an inch thick, streamlined. This beam is fastened to the boat by means of three brads to permit changing if necessary. The lower edges of the outriggers should clear the water about  $\frac{1}{8}$ th inch before the steps on the boat leave the water. The boat and outriggers are covered with silk, shrunk with ambroid and then coated several times with white shellac. It is a good plan to shellac the interior walls of the boat and pontoons before covering to prevent them from losing their form by becoming soft from the influence of water in case of a puncture.

The boat is connected to the frame at its front by two steel wires, their ends being inserted into the cross members of the boat, and then brought up along the sides; crossed and then bound to the frame. A similar pair of connecting wires are used to connect the rear end of the boat to the rear end of the frame. A U-shaped wire is bound to the outrigger beam and frame. A single diagonal strip of bamboo is also fastened to the outrigger beam with a brad, its upper end being bound to the cross bracing of the frame, making a very solid connection.

Under ideal weather conditions this model will fly on 12 strands of rubber with the possibility of a better duration than has been made. But, however, with 15 strands the model will rise at every attempt. More rubber, however, causes the bow of the boat to nose under, and to accommodate this increase of power the boat should be lengthened.







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### A Dry Remark

Raised on a bottle and finished up on a bier.

First Aviator: What's your favorite poem?

Second Aviator: Crossing the bar.

#### Poor Show

Grace: How did you enjoy the show with Tom last night?

Helen: Horrid. His machine was being repaired and we took the street car.

#### Vive-la Redwood!

Birds of a feather flock together,  
So naturally it follows—  
That "larks" are always bound to be  
Accompanied by "swallows."

#### What He Would Do

A tired little boy sat on the curb with his chin resting in his hands.

"I wish I was rich," he exclaimed.

"What would you do with your money if you were rich?" asked one of his playmates.

"I'd buy a great, big motor car," answered the little chap, "so I could fly my kite out of the back of it without running my legs off."

Banged Up Bird: Gee whiz! I'll never try any more of those aeroplane stunts again!

Cimple—Where can I find the write-up of the aviation meet?  
Cimple—In the fly-paper, most probably.—*Tiger.*

#### GOING UP!

She wore a dress,  
I laughed at it—  
For brevity's  
The soul of wit.

—*Awk (Wisconsin.)*

#### WE WONDER, WHAR?

Twinkle, twinkle, little war,  
How I wonder more and more,  
As about the world you hop,  
Where you really mean to stop.

—*Widow (Cornell.)*

#### NOT IN AVIATION.

Avoidupois—I'll bet you five plunks that I can run around that track in less than a minute. Has anyone got a stop-watch?

Wit—You don't want a stop-watch. Hey! Who's got a calendar?—*Burr.*

#### HEARD IN THE HOTEL BARBER-SHOP.

Porter—Boss, yu sho' am dusty.

Patron of the Hotel—All right, George, you may brush off about ten cents' worth.—*Lehigh Burr.*

#### SIMPLICISSIMUS.

She went down to the round house,  
And interviewed an oiler;  
"What is that thing?" "Why," he replied,  
"That is the engine boiler."  
"And why do they boil engines?" asked  
The maiden, sweet and slender;  
"They do it," said the honest man,  
"To make the engine tender."

—*Rose Technic.*

#### DINAH, BLOW YOUR HORN.

A negro was hiring out to an aeroplane contractor in the course of which he had to answer a number of questions.

"Whom shall we notify in case of accidents?" asked the contractor.

"Why, notify me, ob coase, boss, so's ah kin git out ob de way," was Sam's quick reply.

—*Jester.*

Secretary Daniels' plan to have the new navy built at government yards may be hard on the navy, but think what it will do for Charleston, S. C., Norfolk, Va., Pensacola, Fla., and New Orleans.

Not in a long, long time have we heard of anything so singularly appropriate as the assignment to the Russian aviation corps of General Popoffsky.

#### TOWARD THE SETTING SUN.

Somebody has found that the Zeppelins only go over London when the wind is westerly, so that in case of disablement they shall not drift west. The London airmen think that the next one to come over will "Go West," be the wind in any quarter.

## NDED ABNER

By WALT McDUGALL



Courtesy Evening Sun (N.Y.)

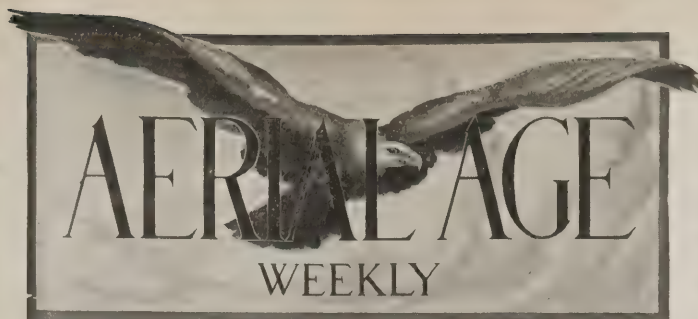


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VOL. II.

NEW YORK, February 14, 1916

No. 22

## Santos-Dumont to Head Aeronautic Federation of Western Hemisphere.

MR. ALBERTOS SANTOS-DUMONT, famous Brazilian sportsman and inventor, has left the United States, bound for Santiago, Chile, where he will attend the aeronautical conference being held there for the purpose of forming the Aeronautic Federation of the Western Hemisphere.

A year ago, the Aero Club of America, appreciating that the tremendous development in aeroplane construction which had taken place was but a modest example of what would take place when the nations of the world would order aeroplanes by the thousands, as they are doing now, and realizing that aeroplanes such as the "AMERICA," and other aeroplanes which can carry useful loads of up to one ton, not including the weight of the aeroplane itself, could solve difficult problems of transportation which restrict developments in South and Central America, foresaw the tremendous possibilities of aeronautics in South and Central America. To foster these developments, the Club conceived the idea of forming an Aeronautic Federation of the Western Hemisphere, in which the national aero clubs of the nations of the Western Hemisphere will unite efforts for the advancement of aeronautics.

Such an organization will have work of tremendous importance to do, and if formed, as the International Federation is, of aero clubs of national importance, which count in their membership representative sportsmen, statesmen, scientists and business men, it will become an organization of international importance.

To carry out the plan, the Aero Club of America wrote to Mr. Santos-Dumont in January, 1915, inviting him to come to the United States and head a Pan-American Committee formed to organize the Federation.

It was the intention of the Aero Club of America to nominate Mr. Santos-Dumont for the presidency of the Aeronautic Federation of the Western Hemisphere in recognition of his valuable pioneer work in the three branches of aeronautics. Mr. Santos-Dumont accepted and came to the United States, arriving last October.

Upon Mr. Santos-Dumont's arrival, plans were immediately made to organize the Federation. Mr. Santos-Dumont was offered the nomination for the presidency of the Federation, and Mr. Cortlandt F. Bishop, vice-president of the Aero Club of America, and vice-president of the Federation Aeronautique Internationale, was nominated as secretary-general. Arrangement was made to establish the offices and headquarters at 297 Madison avenue, New York City, the governors of the Aero Club of America extending to the Federation the use of the club house, its facilities and its extensive aeronautical library, which is acknowledged to be the best in the world.

As these preliminary details were being settled and the Club was about to write to the Aero Club Argentino, Aero Club of Brazil, Aero Club of Chile, and also clubs of other states of South and Central America, regarding this project, inviting them to send their delegates to a conference to be held in

New York, a communication was received inviting the Aero Club of America to send delegates to a conference to be held under the auspices of the Aero Club of Chile. This invitation was accepted, and the Aero Club of America appointed Messrs. Santos-Dumont and Cortlandt F. Bishop as its delegates.

Some of the articles of the proposed constitution of the Aeronautic Federation of the Western Hemisphere are:

Art. 1. Under the name Aeronautic Federation of the Western Hemisphere is established a union of the clubs and societies that control aeronautics in their respective countries in all the nations of the American Continent.

Aeronautics will be directly represented in this Federation by the recognized club or society of each country.

Art. 4. The Federation is charged with the regulation of aeronautics on the American Continent.

Art. 5. The Federation is directed and administered by a Board composed of a president, of ten vice-presidents, of a secretary-general, of a recording secretary, of a treasurer, and of five delegates from each country. The secretary-general and the treasurer must reside at the seat of the Federation, which it is proposed to establish in New York. Every national club or society will nominate five delegates, who shall be designated as sportive, scientific, juridical, military and commercial, respectively.

Art. 7. A conference, composed of delegates from affiliated clubs or societies, will be held each year, in different countries if possible.

Art. 16. Each country represented at the conference shall be entitled, according to the degree of its aeronautic activity, to a certain number of votes, which shall be fixed for the first time at the moment of the country's definite admission.

Votes will be assigned to each country in proportion to the total number of its certificated pilots, this number having been determined on the 31st of December of the year just passed.

Art. 17. The allotment of votes is subject to revision each year at the conference.

Art. 24. For sanctions, pilot certificates and rules for competitions and records, the Federation shall adopt the rules and regulations of the Federation Aeronautique Internationale.

This constitution provides for complete cooperation between the nations of the hemisphere in every respect.

The offer of a \$10,000 Pan-American Aviation Trophy by the Aero Club of America, to be competed for by the representatives of the different countries, the first contest for which is to take place at Rio de Janeiro, Brazil, introduces the sport—the first step taken towards uniting the nations of this hemisphere through sport.

The scientific, juridical, military and commercial delegates will be selected from among the representative authorities of each country, and the result will be the formation of permanent committees composed of the leading experts of each country for each branch.

Mr. Henry Woodhouse, Governor of the Club, states that: "It is expected that the cooperation of the aeronautic engineers of each country will result in important scientific developments. There are problems of engineering to be solved as huge as were solved by Goethals, McAdoo and other master builders; juridical and legal questions to be decided, as stupendously difficult as any Gladstone would wish them; possibilities for the development of international relations greater than were ever conceived; problems of transportation to be solved by the application of aircraft as wonderful as any economist could wish; opportunities to gain distinction splendid enough to satisfy the most ambitious person.

**America Must be Given a Navy Equal to the Best. If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.**



"By including military delegates, it will be possible to evolve perfect cooperation and coordination of aeronautical resources which will be of utmost value for the maintenance of the Monroe Doctrine and the protection of the American continents from without. There will undoubtedly be thousands of aeroplanes put in use for sporting and commercial purposes in South America in the coming few years. As soon as there are ten thousand aeroplanes in use, the American nations will be in the position of the porcupine, which spends its days in peaceful pursuits, harming no one, but is ever ready to defend itself."

#### **Hundreds of Aerial Lines Could be Established Immediately in South and Central America**

While attending this conference, Mr. Santos-Dumont will study the conditions of different countries and outline extensive plans for establishing aeroplane lines between points where such lines can solve difficult problems of transportation and save days of time in the delivery of mail and "express" merchandise.

Authorities state that hundreds of aerial lines could be established immediately, and it is their opinion that aerial transportation is to be a most influential factor in uniting the nations of the Western Hemisphere and bringing them into closer relation. Some of the expressions to this effect are quoted herewith:

Hon. John Barrett, Director-General of the Pan-American Union, says:

"The aeroplane may yet become the most powerful physical influence to bind the American nations together and to make the Monroe Doctrine a Pan-American principle.

"There is no other portion of the world where the aeroplane in its ultimate efficiency can accomplish more for communication than in many sections of Latin America. Such large portions of Central and South America are characterized by precipitous mountain ranges and vast jungle areas that long years must elapse before railroad construction can master the difficulties that these physical conditions present. During the period while scientists, engineers and constructors are harnessing the water powers of the mountains and conquering the jungles for railway lines that will bring all these regions into close contact with the centres of population, the aeroplane builder and the aeronaut must thread lines and routes through the skies that, though invisible, will bind the portions of America with such intimate and useful ties and means of communication that there will be no possible disruption or separation of the nations and their peoples, included in Pan-American and which stand for Pan-Americanism.

"As one who for long years has studied intimately the possibilities of practical Pan-Americanism and the need of evolving the Monroe Doctrine into a Pan-American principle and policy, I feel sure in predicting that aerial navigation and its hand maiden, wireless telegraphy, both representing the highest achievement of science and invention, will yet become the most effective physical influence to bind the American nations together, and make secure not only the sovereignty of each country, but the integrity of all America."

Mr. Alan R. Hawley, President of the Aero Club of America, says:

"I believe with Mr. Santos-Dumont that these aeroplanes of to-day, which already make it possible to carry a dozen passengers and a ton of useful load at a speed of eighty-five miles per hour, can solve most difficult problems of transportation, and that if applied for this purpose as well as for sport in and between the nations of the Western Hemisphere, they will become one of the most effective factors in bringing these nations into closer and most friendly alliance. In the words of Mr. Santos-Dumont, 'the aeroplane will knit the States of the Western Hemisphere into an integrally united, co-operating and friendly combination, allied for their well-being, sport, trade and commerce, as well as for strength in time of possible war.'

"There are thousands of places not yet connected by railways or roads right in the United States, and there must be tens of thousands in the Western Hemisphere—where aeroplanes could transport mail and 'express merchandise' at a fraction of the time required at the present time.

"This is made possible by the fact that the aeroplane can travel in a straight line, by the most direct route, and makes every place an aerial port. All other vehicles must follow roads, and they are handicapped wherever there are no roads.

"For this reason we may well expect that there will soon be thousands of aeroplanes in use for peaceful purposes on

this continent—which will form a valuable aeronautical reserve to be available for the protection of the countries of the Western Hemisphere.

"Despatches from Europe make us realize daily that whereas aircraft are the deciding factor and the most effective weapons against submarines, had the nations of the Western Hemisphere ten thousand aeroplanes in use for sport and commercial purposes this continent would be well protected against unpleasant contingencies."

Mr. Henry A. Wise Wood, President of the American Society of Aeronautic Engineers, who has been actively interested in aeronautics for the past fifteen years, says:

"A few years ago they smiled at the dirigible, and it is shaking the World's imperial city; they laughed at the aeroplane, and it is directing the armies of Europe. They deride the overseas aerial liner, but I declare, not as a dreamer speaking in rhapsody, but as a cold and calculating engineer, that the day is at hand when the building of such a vessel may be begun, and is not far distant ere the liner shall, at established intervals of time, set forth for every capital. Knowing neither land nor sea, nor reef nor ice, nor coast nor boundary, these winged, swift, and ghostly argosies shall make of every town an aerial port, of every hamlet a haven of safety on the coast of that vast ocean of which its earliest navigator sits amongst you here. Then shall there be realized the dream that has led us on, and there be drawn into a single community possessed of a common consciousness the national families of all the earth."

#### **Philadelphia's Municipal Aviation Field.**

NO more important step toward providing the country with aviators has been taken than that just announced in Philadelphia, where Judge J. Willis Martin, Robert Glendinning, the banker, and several other men prominent in the financial circles of the city, have perfected a plan for a municipal aviation field. This group of patriotic men, foreseeing the financial and business obstacles in the way of good men who would like to train themselves for service as aviators in the defense of their country, have worked out a plan whereby young men in Philadelphia and vicinity may learn aviation at home and with little interference with their vocations.

Through the enterprise of this group of financial men, an aviation school is to be established at "The Orchard," owned by the city of Philadelphia at Essington. The proposed school is not in any sense a money-making venture. On the contrary, the men who are sponsors for it will be well satisfied if they can keep the annual deficit down to a reasonable figure.

A bill has been introduced in the Common Council of Philadelphia, providing for the lease of the land to "The Philadelphia School of Aviation" for a term of ten years at the nominal rental of one dollar a year. Contracts have already been let for the construction of two hangars each 150 feet long, 50 feet wide and 40 feet high. They will be completed in April, and six or eight aeroplanes will be purchased and installed in these hangars. It is the expectation of the men in charge that the school will be opened under the direction of a corps of competent instructors some time in May.

"I wish to make it clear," said Mr. Glendinning, "that we have absolutely no thought of making money out of this proposition. In fact, we will be perfectly satisfied if we can keep our annual deficit down to reasonable figures. We realize that the United States must have officers and men for an aviation corps if our plans for national preparedness are to be complete.

"It seems to me that we will be doing a real service to the country if we make it possible for young men who have the physique, the steady nerves, the courage and the enthusiasm to become air pilots, to learn how to fly without forcing them to go far from home and spend more money and time than they can afford to accomplish the same end.

"It costs \$500 just for the instruction fee to learn how to fly at the Hammondsport (N. Y.) school, and it takes from six weeks to six months to complete the course. All that time the pupil has to live at Hammondsport, and has to pay his own expenses, board, lodging, and so on. We hope to be able to charge a lower fee, but even if that is not possible, the pupils will not have to leave their business, and will be able to live at their own homes. It only takes forty-five minutes and only costs five cents to get to "The Orchard." A telephone message from the school about 3 o'clock, and a man could be down there taking his lesson by 4:30 o'clock. And usually late afternoon is the best time for practice flights.

(Continued on page 530)



# THE NEWS OF THE WEEK

## **The Curtiss Aeroplane and Motor Company Acquires Services of W. Starling Burgess & Burgess Company.**

The Curtiss Aeroplane and Motor Company have acquired the services of W. Starling Burgess, of the Burgess Company, Marblehead, Mass., and his organization.

Under the arrangements for acquiring the services of Mr. Burgess and his organization, the Curtiss Company will become the owner of the stock of the Burgess Company, but the Burgess Company will continue under its present operating organization, and will continue to build those types of aeroplanes, especially those of inherently stable design, which have created its distinctive demand from the Government and private sources in America and abroad, and will also absorb a large part of the surplus business which the Curtiss Company cannot handle in its own plants.

W. Starling Burgess will at once become a director of the Curtiss Company and he and his associates will become actively engaged in the business of the Curtiss Company. This addition to the forces of the Curtiss Company is of immense importance to the aeroplane industry.

Today the Curtiss Company leads the world in the manufacture of aeroplanes of manually controlled design, and is engaged in building aeroplanes on large orders from foreign governments. With the aid of Mr. Burgess and his organization, the successful conclusion of its present contracts and its pre-eminent position in the aeroplane industry are assured.

It is expected that this arrangement will result not only in benefits to the companies involved, but also to the entire aeroplane industry in the United States and to the whole aeroplane market. Not only land craft but hydro-aeroplanes and sea-planes of every kind with motors of ninety horsepower and upwards can be rapidly and more cheaply produced.

But the greatest importance of the announcement is from the viewpoint of national defense. America will henceforth have, for the rapid equipment of its aerial forces in time of need, the efficient organization of the greatest corporation in the world now manufacturing aeroplanes. The present capacity of the Curtiss and Burgess concerns is ten per day, and within the near future that rate will be increased. The combined French factories, under war pressure, produce about thirty machines a day, those of Great Britain not more than twenty-five.

Today the coasts of this country are virtually without aerial protection against attack by an overseas foe. The Burgess Company plans to organize at Marblehead a North Atlantic

station for coast defense with a large number of machines available for call. Similar provision is under way by the Curtiss Company at Newport News for a South Atlantic station. The Great Lakes section is protected by the great Curtiss establishment at Buffalo, and the formation of a similar organization at San Diego, Cal., is not far in the future. It is impossible to overestimate the importance of the establishment of these stations for national defense.

The development of the foreign business during the war has made possible a profitable aeroplane industry in this country. Very large foreign orders have been filled by both the Curtiss and Burgess companies, and the prospects for the immediate future are bright. Russia, particularly, is now in a position where she must take aeroplanes, provided they are suitable, in almost any quantity. It has been the lack of flying craft which has been one of the great reasons for Russia's enforced retreats. In every possible way the Russian Government is perfecting its equipment for defense, and, lacking aeroplane factories of her own, she is forced to turn abroad. Each of her allies is working at full capacity, and the United States alone can fill the demand.

The Burgess Company at the present time has under construction (or just completed) thirteen aeroplanes for the United States Government, in addition to a number of machines for use of the National Guard or Naval Militia of the various states. There are also several craft under way for the use of sportsmen, a field in which the Burgess Company has taken prominent rank. Burgess machines have already been supplied to Mr. Vincent Astor, Mr. Harry Payne Whitney, Mr. Norman Cabot and other sportsmen.

W. Starling Burgess, the directing head of the Burgess Company, is one of the pioneers in American aviation. Nearly a decade ago he turned his attention to aeroplanes. He associated with himself Greely S. Curtis, of Boston, who brought to the work the technical training of an expert engineer.

Mr. Burgess was awarded the Collier trophy for 1915. This trophy is awarded annually by the Aero Club of America for the most important advance during the year in aviation.

The business end of the Burgess Company has been handled by Frank H. Russell, previously general manager of the Wright Company, at Dayton. Since its formation the Burgess Company has had a steady growth, and Burgess aeroplanes are known the country over for their beauty of design and workmanship. Where one building and half a dozen men were possible in the Burgess plant in 1910, now more than a dozen structures and two hundred men are kept busy.

The Capitol at Lincoln, Nebraska, as seen by one of the National Guard pilots at a height of 3,000 feet.





### Army Aviation Service Investigation Likely

As we are about to go to press a despatch from Washington advises that a sweeping investigation of the army aviation service is expected to follow action by the President on the recommendations of the court-martial which tried Lieut-Col. Lewis F. Goodier on a charge of having attempted to interfere with the work of the army aviation school at San Diego, Cal. The court-martial verdict carried with it a sentence, Secretary Garrison admitted, though he declined to disclose its nature pending action by the President, who received the papers in the case to-day.

### \$100,000 for the Aero Division of N. J. Naval Reserves

"It was announced at the drill on board the U. S. S. Adams, Hoboken, February 2," says the Hoboken (N. J.) Observer, "that a fund of \$100,000 is in process of being subscribed by men who are interested in the development of the first aeronautical section of the Naval Reserve of New Jersey, for the drilling, instruction and general equipment of the man and the section.

"A programme of activity is at present being planned by which it is hoped that the present year will witness some material progress made by the section, and it is hoped that the establishment of a fleet of aeroplanes for coastal purposes will be brought within practical reach in the near future.

"It is understood that the subscribers to the fund are men who are keenly alive to the necessity of an efficient air patrol for the coast of New Jersey and particularly this section. That this is a national necessity is now widely recognized and some interesting announcements will probably be made shortly in this connection.

It was also announced that the \$5,000 hydroaeroplane that has been presented to the section by the Detroit Cadillac Motorcar Construction Company is now practically completed and that it will shortly be ready for delivery. It will be housed at Bayonne for the present, the practice flights being made there until suitable arrangements can be made for its location in Hoboken.

"The four men who are to take the instruction at Plainfield in accordance with the offer made by President Upperco, of the Detroit Cadillac Motor Company, will be selected after an examination of all those who are able to go to Plainfield and remain there for the six weeks during which the instruction will be given. The expenses of the men will be paid by the government."

### Russian Commission May Purchase Thomas D-2 Tractors

The Russian government may place an order with the Thomas Brothers Aeroplane Company for machines of the D-2 type, in which Aviator Frank H. Burnside recently established a new American speed record of 102.8 miles per hour.

Four officials of the Russian military staff, who inspected the Thomas works, and the new machines, announced after a conference with President W. T. Thomas that they were very highly pleased with the performance of their military tractor. Exhibition flights were made over the Thomas Aviation Field by Aviator Burnside, and notwithstanding the very rough and icy nature of the ground excellent get-aways and landings were made.

These tractors will be equipped with Thomas Model 8, 135 horsepower "V" type aeromotors, which are equipped with Christensen self-starters.

### Thomas Aeromotor Has Twenty-Hour Test

On a visit to the plant of the Thomas Aeromotor Co., at Ithaca, last week, G. Douglas Wardrop, managing editor of AERIAL AGE, had the pleasure of witnessing a block test of their new Model 8 self-starting aeromotor. The motor which was on the block had made a very successful run of twenty hours, and notwithstanding the fact that the atmosphere was very cold, and that the testing shed at the Thomas plant is entirely exposed to air conditions on two sides, the motor was started up by means of the Christensen self-starter in four or five seconds. It ran with a great degree of smoothness, and with very slight vibration for almost an hour, until shut off by George Abel.

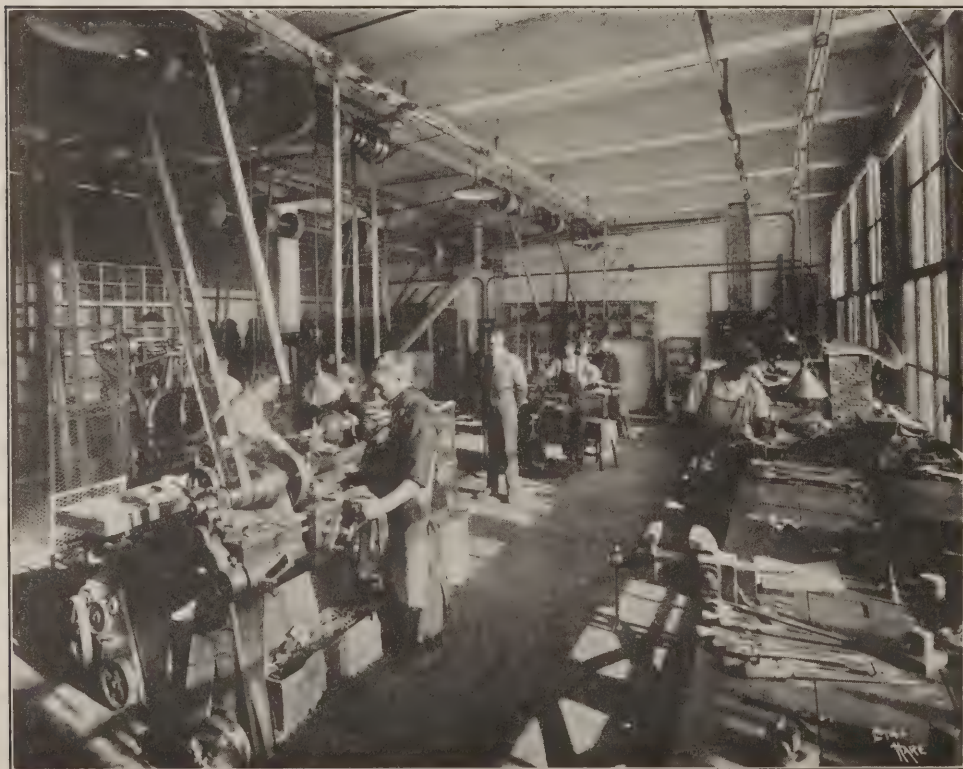
With their experimental machines developing such a degree of efficiency, and their largely increased factory facilities, the Thomas Aeromotor Company are now in shape to take care of any size of contracts.

### President Alan R. Hawley at Palm Beach

Alan R. Hawley, President of the Aero Club of America, after three years of strenuous work in behalf of the club, is taking a vacation in Florida. He has arrived at Palm Beach, with J. C. McCoy on the latter's yacht.

### Chinese Government Wants Aeroplanes

The Chinese Government is about to open a school of aviation at Canton, China, for which it will need several machines. P. R. Josselyn, the American Vice Consul at Canton, suggests that those who are interested should send literature and other information on aeroplanes to the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to file No. 71,681.



The Tool-Room at the Niagara Street Plant of the Curtiss Motor Co.



### Astor Committee Presents Burgess Seaplane to New York Naval Militia

THE Second Battalion of the Naval Militia of the State of New York has been presented with a seaplane, similar to the very latest and most powerful seaplane ordered by the Navy Department.

This seaplane has been secured through the efforts of Messrs. Vincent Astor, Meredith Blagden, Aymer Johnson, Charles Lawrence and Commodore R. F. Forshaw, commander of the Naval Reserve of New York. A committee, composed of these gentlemen, was formed soon after the banquet of the Aero Club of America, which took place on January 12, and at which Mr. Vincent Astor and Commodore Forshaw discussed the aeronautical needs of the Naval Militia. This committee undertook to raise the amount necessary to pay for a seaplane of the latest type for the Second Battalion of the Naval Militia, of which Lieutenant-Commander E. T. Fitzgerald is the head, and which has its headquarters in Brooklyn.

The First Battalion of the New York Naval Militia, of which Commander Charles L. Poore is the head, and which has its headquarters on the U. S. S. Granite State, located at the foot of West Ninety-seventh street, New York, was presented with a flying boat, through the Aero Club of America, by Mr. Glenn H. Curtiss last summer. Ensign Lee H. Harris went to Buffalo to learn to pilot the flying boat, and on his return, the machine was christened by Miss Olive Whitman, daughter of Governor Whitman. The governor and Mrs. Whitman attended the christening, which took place at the foot of Ninety-sixth street, and was a remarkable affair.

The Aviation Detachment of the First Battalion was sworn into service recently by Commander Charles L. Poore. The following enlisted men have started training for the detachment: Ensign Lee H. Harris, who has taken the course at the Curtiss School; Eustice L. Adams, Harold R. Eustis, Robert J. Kahl, who was taking a course as mechanic at the Curtiss School; Frederick E. King, Frank W. La Vista, Charles J. McEnroe, Walter L. Roder, Howard W. Ross.

Mr. Vincent Astor, who is a life member of the Aero Club of America, owns a Burgess-Dunne seaplane, equipped with a 100 horsepower Curtiss motor, which he has been piloting himself.

### \$5,000 More to Train New York Guardsmen

TEN more members of the National Guard of New York will have the opportunity of learning to pilot a military aeroplane and to fly a military aeroplane at least once or twice a week.

Nine will be trained at the expense of a prominent, public-spirited person, whose name is withheld from publication, who has given a \$4,000 check to the National Aeroplane Fund of the Aero Club of America for this purpose. The tenth will be trained, together with an officer of the Militia of Massachusetts at the expense of Mr. T. Jefferson Coolidge, who has contributed \$1,000 to the fund for the training of officers of the Militia of New York and Massachusetts to pilot a military aeroplane.

It has been learned now that Mr. Coolidge was the anonymous contributor of the \$5,000 given last summer to the fund for training members of the Militia of New York and Massachusetts to pilot military aeroplanes. This sum was given \$1,250 to each, the National Guard and Naval Militia of New York, and \$1,250 to each, the National Guard and Naval Militia of Massachusetts.

To keep these aviators in training in case the National Guard of New York does not succeed in obtaining a sufficient number of aeroplanes to permit all the aviators to fly throughout the year, it has been provided in the \$4,000 gift that the course of training shall include one or two flights each week for four months thereafter on a Curtiss military type aeroplane, which is the type of aeroplane used most extensively, and in view of the fact that the Curtiss factory has a capacity of twelve aeroplanes per day, would undoubtedly be used most extensively by American aviators in case of trouble.

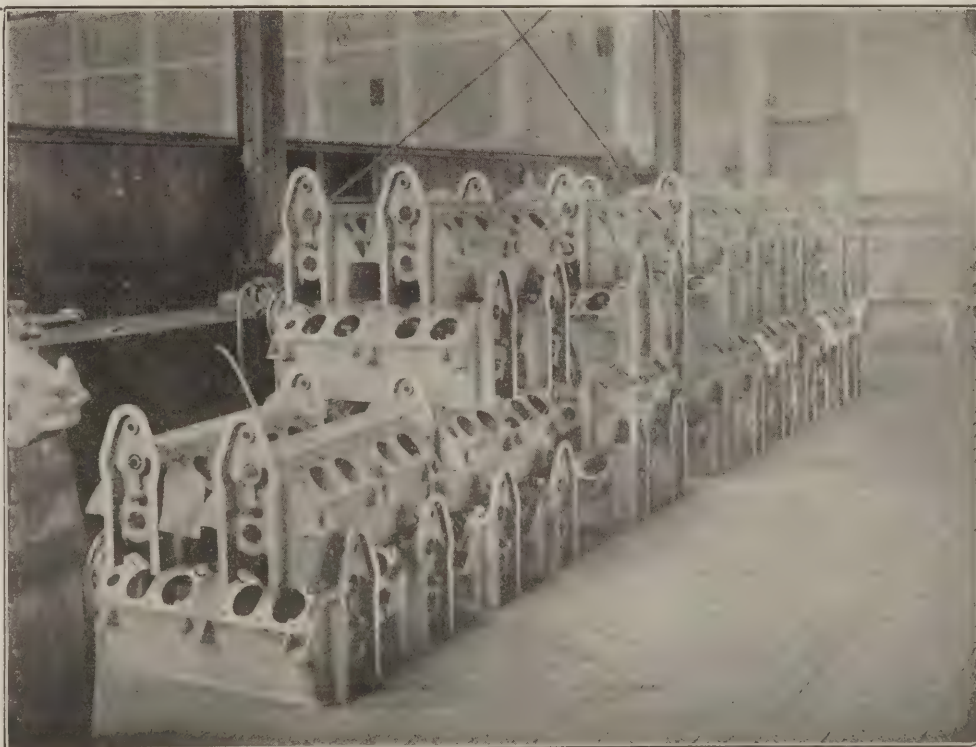
To train these nine guardsmen as provided by this gift, the Curtiss Aeroplane Company, of Buffalo, will establish a school at Sheepshead Bay Speedway, which is to become an aviation center by the end of April, and where there will be flying competitions in which a score of aviators will participate every Saturday.

The guardsmen will be trained under the supervision of Lieutenant Raynal C. Bolling, the commanding officer of the Aviation Detachment of the National Guard. The Aviation Detachment has already ten men learning to fly. Some of the men are members of prominent New York families, such as Messrs. Herbert Carolin, James E. Miller, Fairman Dick, J. H. Stevenson, Frederick S. Hoppin, George Von Utassiy, and R. V. Arnold. They have been training throughout the winter, notwithstanding the bad weather.

The Aviation Detachment was organized in November, the National Aeroplane Fund having given 12,500 for the equipment.

The National Aeroplane Fund has, therefore, in seven months, been instrumental in getting a flying boat and course of training for four men for the First Battalion, New York Naval Militia; a seaplane for the Second Battalion of the Naval Militia; an aeroplane and training for sixteen men of the New York National Guard.

The photograph shows a number of aluminum crank-cases that are being used in the Sturtevant Model 5 140 h.p. eight-cylinder V-type aeronautical motor. The aluminum castings which are being turned out daily in the B. F. Sturtevant Company's foundry at Hyde Park, Mass., have been pronounced by experts to be superior to any manufactured in the world, including those of Belgium, which has achieved a world-wide reputation for its splendid aluminum work.



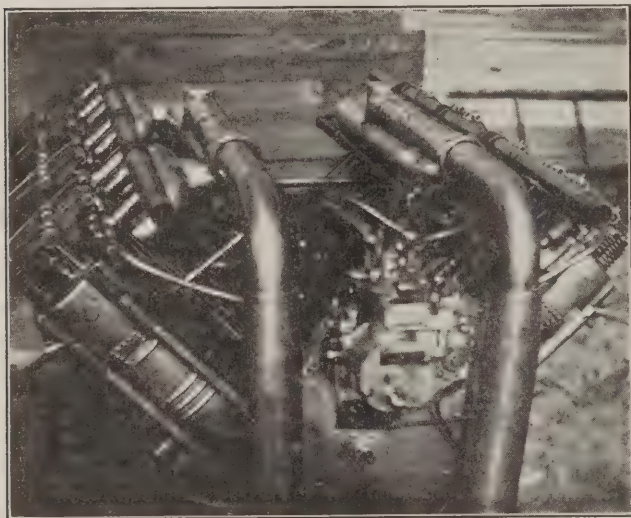


## THE CHRISTENSEN SELF-STARTER FOR AERIAL MOTORS

THE N. A. Christensen Company, of Milwaukee, Wis., is manufacturing a self-starter especially for aeroplane motors. It can be applied to old or new motors of any multiple cylinder type, is compact, light in weight, simple in operation and very highly efficient.

It is well understood by manufacturers and users of gasoline motors that the operation of such motors depends entirely on a charge of air and gasoline in vaporized form drawn into the cylinder, compressed by the piston and ignited by means of an electric spark. This being the natural condition under which the motor operates, in order to start a dead motor it is necessary to bring about this natural condition of furnishing the compression stroke, without manually turning or cranking the motor.

After years of effective study, research and practical experiment, Mr. N. A. Christensen, the inventive genius of the company, who has acquired an international reputation in



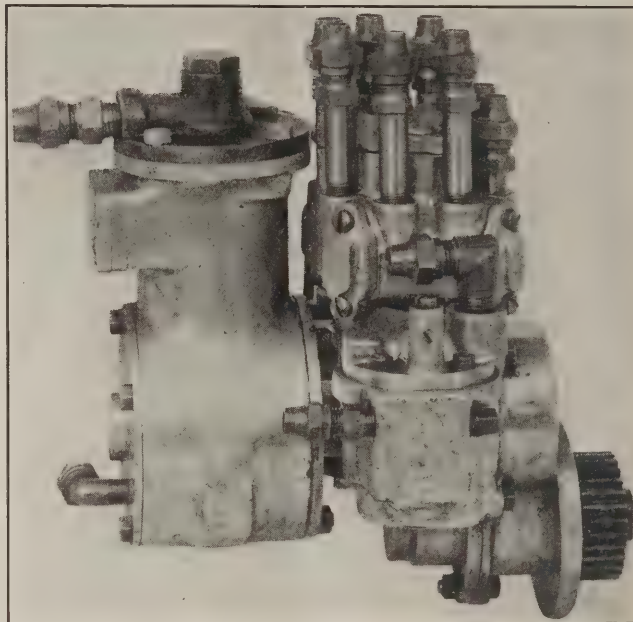
The Christensen Starter on the Curtiss Eight.

pneumatics and engineering, perfected a unit composed of an air compressor, carburetor and automatic distributor, which accomplishes all these things by merely pressing a button.

The operation is as follows: Air is first pumped from the compressor into a tank conveniently located in the fuselage.

To start the motor the compressed air is drawn through the control valve on the dash or instrument board to the special carburetor (part of the unit) where it picks up the gasoline in a thoroughly atomized form and through the automatic distributor, this gasoline gas under compression, is carried to the motor cylinders in firing order.

The charge of gasoline and air (the compression stroke as it were) immediately starts the piston moving downward, the



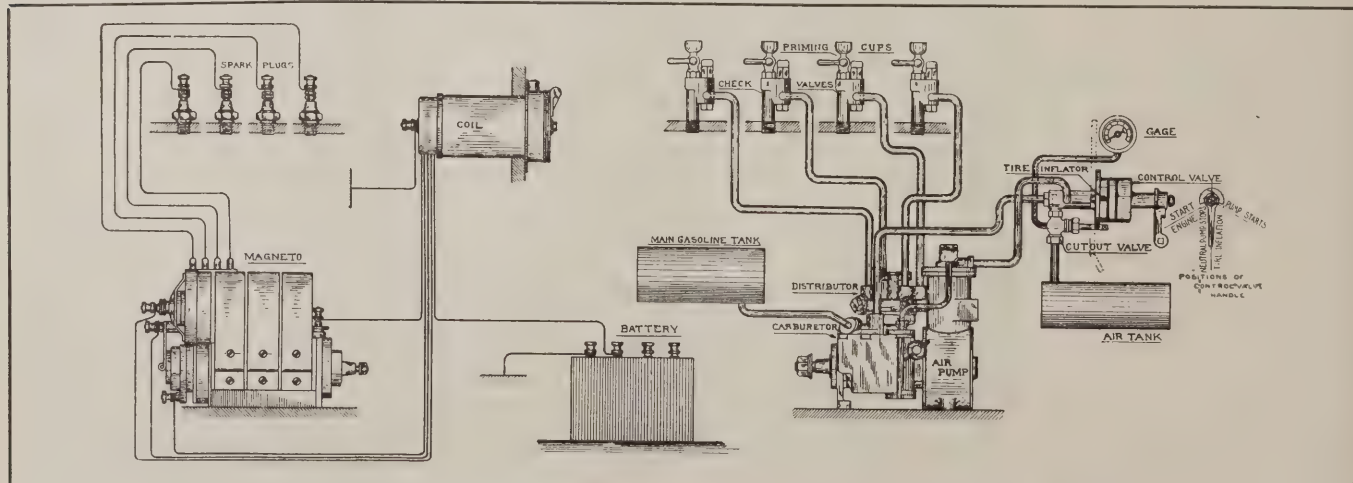
The Christensen Self-Starter.

spark takes place, ignites the charge and the motor is set in motion.

The control valve governs all operations from the driver's seat. One position of the handle is for starting, another for throwing the pump into and out of service, and a third for tire inflation. When the engine is running all parts are out of engagement, consequently there is no wear. Lubrication is automatic. All the parts are made of aluminum and chrome vanadium steel, heat treated and ground to a perfect fit, and the starter will outwear the motor on which it is mounted. The lubrication is automatic. There is no hesitation in starting, no churning of gears, etc., no complicated system of wiring, no short circuits, no storage batteries and the weight of an aeroplane outfit is about 40 pounds. The apparatus is fully guaranteed in every respect.

The marked efficiency of the self-starter is perhaps best suggested by the results of a test on a Hall-Scott motor made at the Sloane Manufacturing Company's plant in Plainfield, N. J. There on a tank of air of 250 pounds pressure, 28 complete starts were made without recharging the tank, and the last start was made on the low pressure of 100 pounds. Both Mr. Sloane and Mr. Day, of the Sloane company, were so pleased with the high efficiency and reliability demonstrated that they will adopt this starter as standard equipment.

The basic reliability of the starter is further suggested by the fact that New York City has 96 Christensen starters in use on motor fire apparatus.





## COMMERCIAL TESTS OF STURTEVANT AERONAUTICAL MOTORS

AS the manufacture of gasoline motors for aeronautical purposes has become a more staple industry, purchasers of such motors are demanding careful trials at the manufacturers' plant to determine exactly what power the motor is developing. The B. F. Sturtevant Company has always maintained a testing equipment at the service of purchasers and which accurately indicates the power developed and makes possible the determination of all other important data.

The accompanying cut is a photographic reproduction of a test report on the 140 H. P. eight cylinder Sturtevant motor exactly as it was made out during the test and witnessed by United States Navy Officers. Furthermore, all readings were checked by these inspectors.

It will be noted that the sheet is not filled out exactly in accordance with the headings at the top as, for instance, there was no static thrust reading and the torque was carried along into this column. Similarly, in the readings taken with a propeller and shown at the bottom of the report the torque in pounds is shown in the thrust column. The thrust of the propeller was not recorded. It should be understood also that the propeller shaft operates at three-fifths the speed of the crankshaft, which make the horsepower formula read:

$$\frac{R. P. M. \times \text{Weight on Scales} \times 3}{1000 \times 5}$$

The readings show an average of 143 H.P. at an average speed of 1979 R.P.M. The rated speed of the motor is 2000 R.P.M. and consequently the power at that speed would be 144.6 H.P. The motor is commercially rated at 140 H.P.

A short description of the dynamometer used will be of interest, although the principal, of course, is well known. The motor is mounted on a cradle arranged on ball bearings, so as to allow it to rotate around the propeller shaft centre and also to move parallel to the axis of the propeller shaft. This cradle is supported in a frame work at sufficient height to

clear a twelve foot propeller. A torquet arm 63.025" in length is attached to the cradle and, of course, by measuring the pull at the end of this arm the reaction on the frame of the motor is measured. This reaction, being equal to the action, is a true indication of power developed.

There is practically no error which can come into the readings. The torque is weighed through a spring balance on platform scales. The thrust is measured on a spring balance through a bell crank and all the readings can be taken simultaneously. Speed is read from a tachometer and by actual count, so that it will be seen that all readings are constantly checked.

Where it is not desirable to test each propeller in connection with the motor which will drive it, a moulinet or fan dynamometer is used and can be arranged to absorb the full power of the motor at any speed desired. As the characteristic power-speed curve of the moulinet is practically the same as that of a propeller, tests through the operating range of the motor can be made with it equally as well as with a propeller. In other words, motors tested on this form of dynamometer are always tested under conditions identical to those met with in actual service.

The Sturtevant Company, in addition, has available a water absorption dynamometer which can be used and also complete electrical testing equipment. For preliminary tests and tests of many hours' duration, a number of motor stands are provided, and fully equipped, so that from the time one motor is stopped another can be mounted and running on the same stand in thirty-five minutes. All this testing apparatus is situated in a large separate building constructed for the purpose and equipped in the most modern way. For propeller tests a part of the roof can be slid back and the two ends of the building thrown open, removing practically all restriction.

Though already well equipped to make practically any kind of test on gasoline engines, it is the company's intention to add further apparatus for special experimental and development work, which is being carried on continuously.

B. F. STURTEVANT COMPANY, Hyde Park, Boston, Mass.															Date <u>1-2-16</u> 191 <u>6</u>		Remarks
MOTOR TESTING DEPARTMENT															Timing		
Model	Run No.	R. P. M.	Thrust Pounds	Static Thrust	Brake H. P.	Consumption Gallons			Temperature Fahrenheit		Water Consumption	Barometer	Magneto	INTAKE Close after Bottom Center Open after Top Center	EXHAUST Open before Lower Center Close after Top Center	Magnetos Timings	
Type					Max	Min	Oil	Gasoline	Oil	Jacket Water	Air	Carb.					No.
							Per Hour	Per R. P. M.	Per R. P. M.	Ingoing	Outgoing						
	1945	1600			141	142				164		44	30.55	2487039			
	10.00	1967	118 1/2	119	141	142				168		44		2191247			
	10.15	1975	119 1/2	120	143	144				168		44		2000			
	10.30	1990	119 1/2	120	142 1/2	143 1/2				166		44		D. V.			
	10.45	1970	119 1/2	120	142 1/2	143 1/2				165		44					
	11.00	1970	119 1/2	120	142 1/2	143 1/2				166		44					
	11.10	1965	119 1/2	120	142 1/2	143 1/2			240	166		44					
	12.00	1840	Tach	122		134											
	12.05	1820	Counter	122		133											
	12.15	1820	Tach	122													
	12.16	1852	Counter	122													
Test in Charge of <u>G. K. By</u>															O. K. By <u>G. K. By</u>		Burgers Propeller 3160 9 x 7 ft. p.d. Oil fuel 35 lbs.



## THE AERO TRAILMOBILE

THE general use of the aeroplane in army operations, especially when the army or a portion thereof is on the march, necessitates provision for a traveling base from which the aeroplanes can obtain repairs, readjustments and supplies.

In the recent flight of six army aeroplanes from Fort Sill, Okla., to San Antonio, Texas, two Trailmobiles, manufactured by the Sechler & Co., of Cincinnati, were used and their behavior was such that at the conclusion of the trip of 450 miles, Capt. Foulois, in charge of the aviation division, recommended the purchase of the Trailmobiles, "In order that tests may be made to determine their suitability for use in carrying reserve aeroplanes and reserve supplies." His report was approved by the war department.

The equipment of the aeronautic division besides the six aeroplanes consisted of eight motor trucks and four motor-cycles.

One difficulty encountered before the start was a proper carrying place for the aeroplane hangars or house tents. The big trucks were full of camp equipment and machine shop equipment, and as the men of the squadron were also transported on these trucks, they were all loaded to capacity and some carried an overload. A solution to this problem was found by the use of two Trailmobiles—(a trail vehicle for use behind the motor trucks). These two Trailmobiles carried the (6) hangars, making each one of them carry a load of about 1,400 pounds. Being carried in this manner, where they were easily accessible, the hangars, in case of high wind or rain, could be taken from the Trailmobiles and put up very quickly.

The roads and bridges were in a condition that severely tested the mechanical equipment. This first ninety-mile leg of the journey proved to be about the hardest on account of the deep sand they had to go through, and also on account of the poor construction of the bridges. In places, the sand was hub deep and only the most painstaking drive on the part of the chauffeurs kept them from being stalled and having to be pulled out. Again the poor condition of the bridges hindered the progress of the trucks. The heavy trucks, loaded to capacity, and some even overloaded, broke through the 2-inch planks of some of the bridges and went into the hubs. More than two-thirds of the bridges passed over, were in some manner broken or damaged.

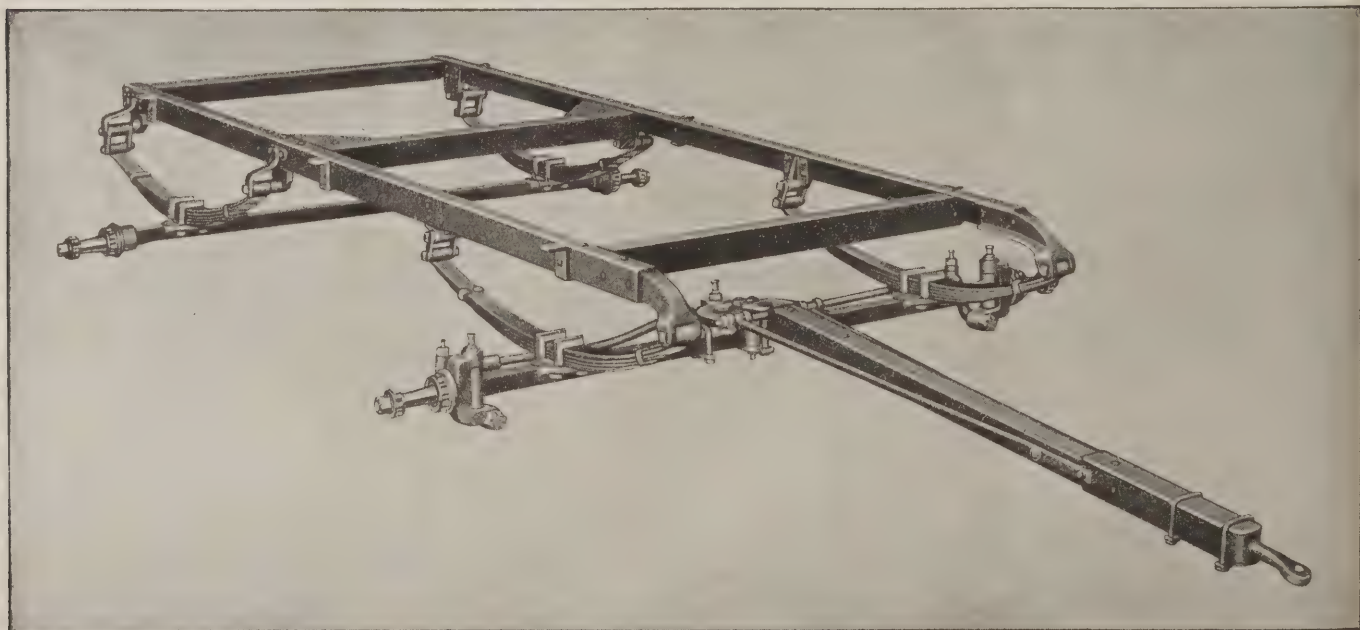
The last 90 miles of the trip from Austin to San Antonio was made over good roads—the best that were found between Fort Sill and San Antonio. Over these roads good time was made and in some places 25 miles per hour were made, with a loaded truck and a loaded Trailmobile behind. This extreme speed behind the heavy truck, gave the Trailmobile a good chance to show what it would do and how well it would



stand up. There was tremendous strain upon tires and wheels and the frame, and yet under this terrible strain the Trailmobile stood up, did its work perfectly, and not a bolt, or a nut, or even a tire was loose at the end of the journey. It could not be turned over, heavily loaded though it was, and it followed perfectly around short curves at high speeds. It was a revelation to the army men, to see the way it acted under conditions which were imposed upon it, and by its performance it gained their admiration and hearty approval. It seems almost impossible that it could have stood up under conditions, and the fact that it did shows the care with which the Trailmobile had been designed and constructed.

All along the way, the men who saw the trucks and Trailmobiles pass showed their interest in the Trailmobile. Inquiries were made as to its price, capacity and the place where it was built, showing with what interest people are regarding this coming game of trail-hauling. Nothing but praise was heard. The sturdy construction of the Trailmobile was noted and approved of, and the men who saw it at once understood how useful and profitable it was bound to become.

Equipped with one or more Trailmobiles the owner of a truck or an automobile can add to the efficiency of his machine and Sechler & Company, foreseeing the almost unlimited field for these vehicles, are manufacturing a great variety, a long line of them adapted to various industries.



Chassis of Trailmobile Used as Part of Aeroplane Squadron Equipment.



# THE SUNBEAM-COATALEN

## 225 H.P. AERO ENGINE

**T**HIS engine has been especially designed for aviation, and is of the V-type with fixed cylinders. These are disposed in *en bloc* castings in four sets of three at 60 degrees on the crank chamber. They are made from a special grade of cast iron, enabling the water jackets to be cast extremely thin, at the same time maintaining strength.

The valves are on the inside of each row of cylinders and are actuated by a single camshaft which is housed in the top of the crankcase, between the two sets of cylinders, and which is lubricated by oil fed from the main duct.

The crankshaft is carried by bearings, between each throw, of large diameter.

The connecting rods are arranged so that the big ends are side by side on each crank throw. The opposed cylinders are staggered in relation to each other to allow this. The water circulation is by a gear-driven centrifugal pump.

Two magnetos are fitted, each operating six cylinders.

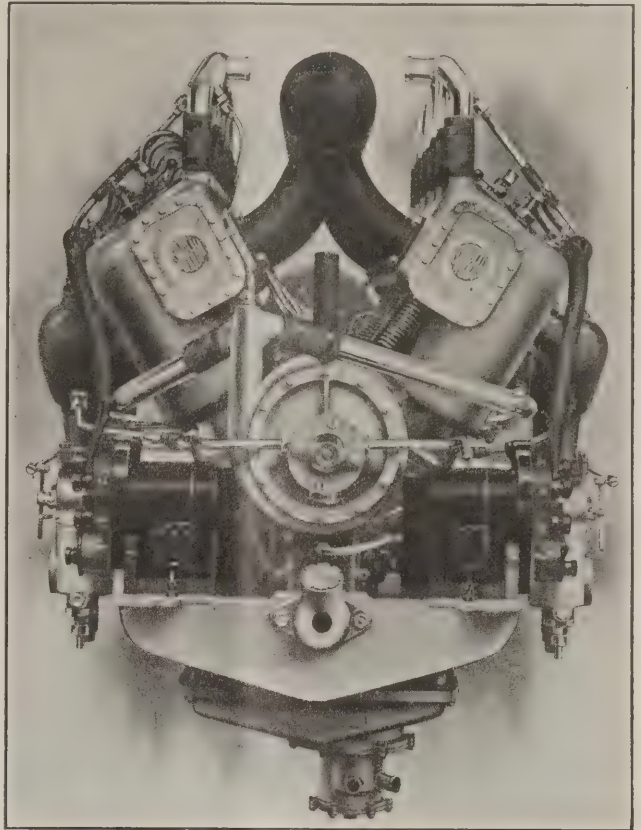
Lubrication is forced by a gear-driven pump, which is fed direct from an oil tank separate from the engine. This forces the oil to the main bearings, and from thence it passes through the hollow crankshaft to the big end bearings. From these bearings it is splashed to lubricate the cylinder walls, after which it runs to the pump through a filter of large dimensions, and is returned by a secondary pump to the oil tank, so that it is not exposed to the heat generated in the crankcase for any length of time. It thus retains its lubricating properties, enabling the oil to be used over and over again.

The engine is fitted with a reduction gear of 2-1, enabling a large propeller to be used at a slow rate of revolution with great efficiency; at the same time a very even torque is imparted by the engine to the propeller.

The reduction shaft is specially mounted on ball bearings, and is provided with a special design of thrust bearing, thus allowing the engine to be used for either a tractor or a propelled type of machine without alteration to the design.

### Specifications.

Bore and stroke: 90 mm. x 150 mm.



End View Sunbeam-Coatalen 225 h.p. Aircraft Motor

Crankcase: Special strong aluminum alloy.

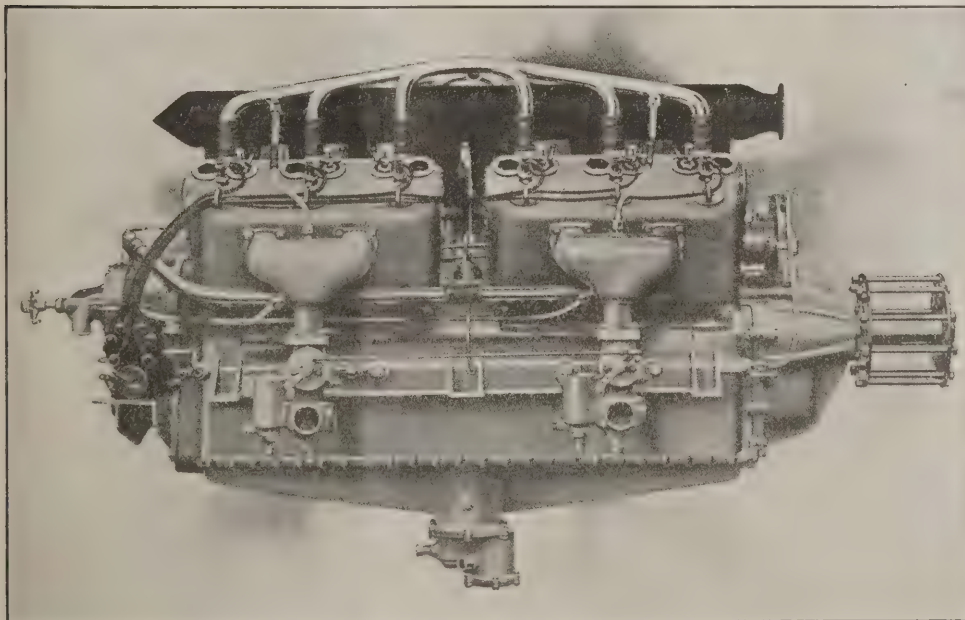
Self-starter: Special air distributor fitted with valves and pipes, complete, ready for coupling up to a compressed-air bottle.

Carburetors: 4 C. Z. 40 mm.-type Claudel Hobson.

Revolutions: Normal revolutions of the engine 2000 r.p.m. giving a propeller speed of 1000 r.p.m.

Consumption: The consumption of gasoline is about .58 of a pint per h.p. hour and the consumption of oil is about 3/4 gallon per hour.

Weight: The approximate weight complete, less radiator, is 905 lbs.



Side Elevation of 225 h.p. 12-Cylinder Sunbeam-Coatalen Aircraft Motor





# FOREIGN NEWS

By JAMES E. CLARK



## AUSTRIA

Dr. Leo Strisower, professor of international law at Vienna University, has published an article on "Cruelties and Success in the War and Their Relations to a Shortening of Hostilities." In substance he is against the cruelties practiced on women and children by the use of Zeppelins and U-boats where no military advantage is to be gained. He points out that such cruelties strengthen the war spirit and the determination of the enemy and call to the enemy's aid new resources which otherwise would be lacking. "Thus even from a purely military point of view," says the professor "such acts are incapable of excuse." That such an article was passed by the censor is regarded as suggestive of the attitude of official Austria toward the Zeppelin raids on non-combatants.

Austrian aviators conducted a raid on Durrazzo, Albania, during which manifestos were dropped advising the Serbs to return to Serbia.

## BULGARIA

In a raid by French aeroplanes on the Bulgarian lines near Lake Doiran, as reported from Salonica, 200 bombs were thrown on the Bulgarian camp. Five hundred tents were burned, the whole camp was destroyed and many Bulgarians were killed or wounded. An official Bulgarian report, forwarded from Athens to Paris, says that 470 men were killed and more than 500 wounded in this attack.

The raid is said to have been made by seventeen aeroplanes. The camps were located at Petrich, in the Strumitsa Valley. The bombardment was over in twenty minutes.

## FRANCE

French air raiders succeeded in blowing up a military train proceeding from Freiberg. Many persons were killed or wounded.

According to information received by the French military authorities Germany has been making great strides in aeronautics and now has half a dozen different styles of aeroplanes for fighting and reconnoitering are superior to anything that they have heretofore employed. Among them is the L. V. G., a machine of 160 horsepower and with a speed of 100 miles an hour. It is able to climb 1,000 feet in fifteen minutes and 12,000 feet in forty minutes. It is fitted with electric lights, bomb throwers, flash signalling devices and star lights, and is armed with Lewis machine guns which are regarded as the most efficient for air work.

But, on the other hand, an engineer who has just been privileged to make an inspection of the French aviation plants was astounded at the intelligence, activity and daring of the French experts and he declared that if the facts were known Frenchmen would smile at the claim that Germany was superior in aeronautic equipment. Says this observer: "We now have gunplanes able to climb like elevators and capable of catching up with Zeppelins at any height."

French newspapers have offered a reward of 25,000 francs (\$5,000) to the first airman who will bring down a Zeppelin within the lines of the French and a reward of 10,000 francs to any gunner in the anti-aircraft batteries who will hit a Zeppelin with a similar result.

Sergeant Pilot Guynemer of the French Aviation Corps on February 5 attacked an enemy aeroplane in the region of Frise. His fire set it in flames and it fell like a great torch between Assevillers and Herbecourt. This is the fifth machine which this aviator has brought to the earth.

Declaring that the German official statements of aeronautic losses are incorrect the *Temps* of Paris gives the following figures of aeroplane losses of the various combatants from October 1, 1915, to January 31, 1916:

Thirteen English and seventeen French aeroplanes lost, eleven German aeroplanes destroyed on the English front and twenty on the French front.

Of the seventeen French machines lost, the *Temps* says, four were downed in aerial combats, one by artillery fire, three were forced to descend by motor troubles and eight disappeared on long scouting missions.

"The comparison marks the difference between the tactics on each side," the *Temps* continues. "German pilots seldom cross the French lines. It is even forbidden in some of the armies for aviators to pursue the enemy or to go and seek him."

"The latest English statistics give 1,227 British flights over German lines, while only 310 Germans cross the British lines. As regards a single day the utmost number of flights recorded is 170, all of which crossed the enemy's lines."

## GERMANY

In the region of Peronne, in the Western Theatre of War, German airmen shot down two aeroplanes, one an English and the other a French machine. Three of the occupants were killed and the French observation officer was seriously wounded.

In celebration of the German raid on Paris, the town of Friedrichshafen, the site of the chief Zeppelin factory, was on the day following the air raid on Paris beflagged and en fête, and the children of the town were granted two holidays in celebration of the event. Scores of congratulatory telegrams reached Count Zeppelin at Stuttgart. The general cry in Friedrichshafen was "London next!" and the phrase was even chalked on the walls.

An official communication says that there has lately been pronounced activity on both sides in East Galicia and Volhynia by aviators. A Russian squadron threw six bombs on Buezacz, killing two inhabitants and wounding several others. Another Russian aeroplane dropped a bomb northeast of Luckrei, which wounded Russian prisoners.

An Austro-Hungarian air squadron successfully bombarded the districts west of Courthov anad north of Zharaz.

An air squadron has bombarded east of Kremmetz, the Russian halting place of Shumsk. Numerous houses were burned.

The fortifications of Dvinsk, on the Russian front, have been attacked by a German airship, but the damage inflicted, if any, has not been reported.

Fire has virtually destroyed the Johannisthal Aerodrome, just outside Berlin, according to private telegrams from Munich and Stuttgart, received in Switzerland. Six or nine new aeroplanes are reported to have been destroyed in the blaze, which is said to have been the work of spies. No lives were lost.

## GREAT BRITAIN

Official figures of the result of the Zeppelin raids over England's eastern and midland counties place the number killed at 59 and the

number wounded at 101 persons. Most of the people killed belonged to the poorer classes and met death while in their homes. While all of England clamors for reprisals, experts find some satisfaction in the statement that the six or seven Zeppelins in the raiding squadron were obliged to drop approximately two bombs to kill one person. Many of the missiles fell into canals and gardens. In one place in Suffolk one of the Zeppelins dropped 40 or 50 bombs in an open field and the only damage done was the killing of two hens. But in the raided districts scores of workmen's humble homes were wrecked.

The claim made by Germany that all of the Zeppelins succeeded in reaching home safely is now doubted in England. Immediately following the raid a trawler in the North Sea, responding to signals of distress seen flashing in the sky at daybreak, came upon a huge dark mass floating in the water. When dawn came it was seen to be the German Zeppelin L-19, wrecked and partly submerged, the cabins and a portion of the envelope being under water. Twenty men were huddled on a platform along the top of the airship. They hailed the trawler and asked to be taken off. As the crew of the trawler numbered but nine men and there was estimated to be a total of thirty armed men aboard the wreck, the skipper of the trawler feared that if he took the armed Germans aboard they would take possession and carry him and his crew to Germany. So he declined to accept promises and offers of gold and steamed for the nearest port to notify the authorities in order that an armed boat might be sent to the rescue.

British naval vessels which made a thorough search of the waters in the vicinity of which the Zeppelin L-19 was reported to be floating have returned to port with the report that they could find no trace of her or the crew of thirty. As the wind was freshening when the trawler steamed away it is the general belief that the big dirigible went to the bottom with all of its crew. An official communication issued in Berlin confirms the loss of the L-19 by saying that she had not returned from a reconnoitering flight and that inquiries concerning her have been without result. It is possible that this Zeppelin is the one that cable dispatches report as having been fired upon by Dutch soldiers from Holland in the Island of Ameland. Sixty shots were aimed at her and she is known to have been hit, but she disappeared in a northeasterly direction. Some English authorities are of the opinion that the L-19 might have been shot by one of the English coast batteries during the midland counties raid and was endeavoring to reach home in a crippled condition when she fell into the sea.

It was the L-19 which two months ago stopped a Swedish ship in the North Sea and while two other Zeppelins stood by sent a party aboard the steamship to inspect its papers and purchase provisions. On this occasion the dirigible descended to within a few yards of the surface of the sea and lowered a boat, into which the boarding party dropped.

Reports from Berlin say that Emperor William, Admiral von Tirpitz and Prince Henry were present at a headquarters council when the details of the Zeppelin raid on England were planned.

Since the beginning of the war twenty-one Zeppelins and eight other warships of the air belonging to Germany have been lost, according to an estimate made by the *London Chronicle* and based on reports issued from time to time.

Of the crews, 124 were killed, 150 were taken prisoners and 27 were interned in Denmark.

Last March Count Zeppelin in a statement published in the *Constanzer Nachrichten*, admitted that since the outbreak of hostilities nine of his airships had been lost through various causes.

In the German raid of February 1 on England a captured steamer, the *Frank Fischer*, in use as a collier, was destroyed by a bomb dropped from a Zeppelin at night, causing a loss of thirteen lives. The vessel was at anchor when a noise was heard overhead. Then the Zeppelin came into view, flying low. It dropped a bomb which fell on the deck amidships and two minutes later the vessel sank, dragging down all with her. Three men swam to the surface, caught life belts and kept afloat an hour, when they were rescued.

Sir Percy Scott will relinquish command of the air defenses of London. They will be taken over by the staff of the home army, of which Lord French is commander-in-chief.

## GREECE

A Zeppelin which bombarded Salonica on February 1 inflicted severe damage on the city and threw the inhabitants into a panic. The dirigible, which was of very large dimensions, first made a wide detour of the city and then dropped five bombs, which fell into the harbor and did no damage. The ships at anchor opened fire on the dirigible, but after fourteen shots were obliged to cease on account of the danger of killing inhabitants of the city. One bomb from the Zeppelin fell on a warehouse filled with oils, fats, benzine, etc., and the building instantly flared up like a torch. Another bomb destroyed the Mosque of Yussuf Pacha, killing three and injuring eleven refugees from Asia Minor who were sheltered in it. Another bomb crashed through the roof of a dwelling and killed five persons, and still another tore a woman to fragments and injured a small boy. The bombs thrown weighed about 100 pounds each and were dropped from a height of 2,000 feet. The raid ended when a number of fast aeroplanes ascended in pursuit of the Zeppelin.

Dispatches to London from Salonica say that two Greek soldiers, five refugees, seven workmen and fifteen others were killed and about fifty civilians injured by the Zeppelin raid.

An official statement issued at Paris regarding the Salonica raid corroborates the unofficial report regarding the casualties, and says bombs fell on the Greek Prefecture and another on the general treasury of the Bank of Salonica, completely destroying it.

"An enemy aeroplane was brought to earth by one of our machines between Topsin and Verria, west of Salonica," the report says.

## RUSSIA

A large number of aeroplanes have lately been reported as flying over the Russian positions at Dvinsk and some Zeppelins have been reported to be reconnoitering in the same neighborhood.

Russian aeroplanes, during the course of a reconnoissance north of Lake Norzone, bombarded the enemy's lines and convoys on the Vidzy road and escaped the enemy's artillery fire without any damage. On the middle Strypa front a Russian aeroplane threw bombs on the stations at Erzna.









**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### The Main Question

Victim: What has happened? Where am I?  
 Doctor: You have been seriously injured in an aeroplane accident. But cheer up—you will recover.  
 Victim: How much?

#### Tremendous Tolls

"Professor, how would you like to receive a message from Mars?"  
 "Prepaid?" asked the professor, cautiously.

#### Military Tactics

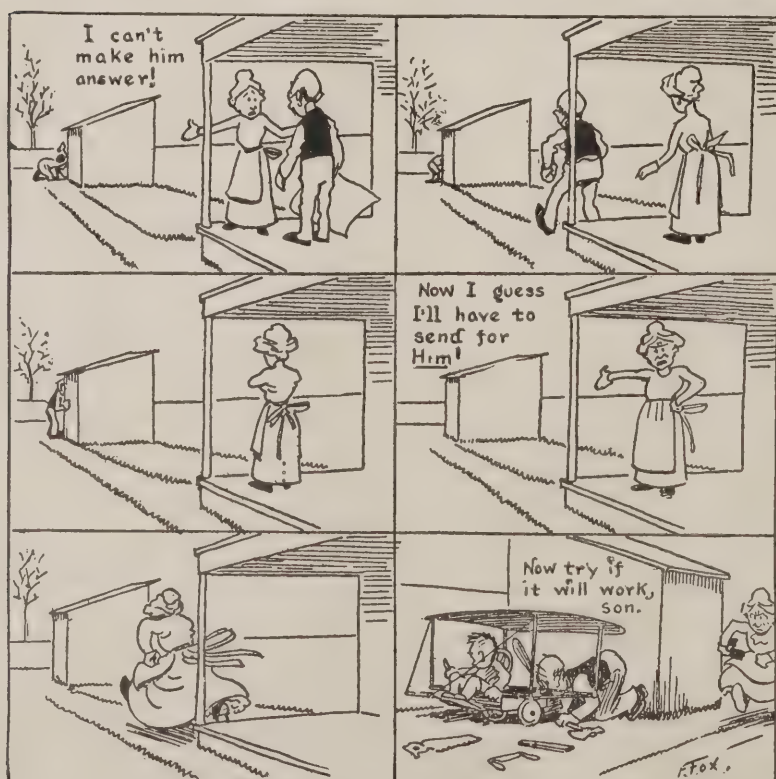
"My wife is going through some army manoeuvres with her last year's hat."  
 "What d' ye mean army manoeuvres?"  
 "Well, she's turning the wings."

#### Their Value

"So you bought one of those flying machines they tell so many funny stories about?"  
 "Yes," replied Mr. Wiggins, "and it is saving me a lot of trouble and wear and tear. When your friends tell you jokes about your machine they don't expect you to ask them to ride around in it."

#### Probably Both

Flora: I wouldn't marry any man who was not adventurous and brave.  
 Dora: Wouldn't or couldn't?



The Craze.

#### Aviation School at Ford Worth

Carl Maer, a native of Nuremberg, Germany, who is now in Fort Worth, Texas, constructing two aeroplanes, expects soon to establish an aeroplane factory there and to run in connection therewith a school of aviation.

Aviator: Doc, I owe you my life.  
 Doctor: Yes, and that isn't all.

#### The Steady Subscriber.

How dear to our hearts is the steady subscriber,  
 Who pays in advance at the birth of each year—  
 Who lays down the money, and does it quite gladly,  
 And casts 'round the office a halo of cheer.  
 He never says: "Stop it; I cannot afford it;  
 I'm getting more papers than now I can read;"  
 But always says: "Send it; our people all like it;  
 In fact, we all think it a help and a need."  
 How welcome his check when it reaches our sanctum!  
 How it makes our pulse throb!  
 How it makes our hearts dance!  
 We outwardly thank him; we inwardly bless him—  
 The steady subscriber who pays in advance.

Those German newspapers which are hailing the Zeppelin raids as masterpieces of German genius will find themselves in difficulties with Admiral von Tirpitz if they don't modify their enthusiasm.

Women fainted when Art Smith's pseudo flight at the S. F. Auditorium ended in a crash.

In the first flash of panic the supposition was that the daring aviator had been killed.

As Art emerged smiling from the wreckage, one husband came up, grasping him by the hand, and said: "Art, come over here, quick. My wife fainted and now she is in hysterics. I want to show her that you are alive."

Art went over gladly and willingly. The woman took one look at him and all was right again.

Another husband rushed up. "My wife has fainted," he said. "She thinks you're dead."

Art went over to where she lay on two chairs, and waited until she became conscious.

When she saw him, her eyes became glassy, and she stared in a sort of fixed horror at him.

"His ghost! His ghost!" she cried, and swooned again.

#### Sport.

How is sport to be defined?

There is Jones, for instance, who thinks the only sport in the world is to go out in the mountains every summer and kill a grizzly, and

There is Smith, who is a checker fiend, and  
 There is Brown, who collects autographs, and  
 There is Green, who goes to choir practice twice a week.

And there are a number of persons of our acquaintance who spend an entire night trying to fill a split straight.

#### Philosophy of Happiness.

Cheer up! It might be worse! Just supposing that every time you swing at a golf ball and miss it you cracked yourself on the ear!



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VOL. II.

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No. 23

## Aero Coast Patrol System for the Atlantic and Pacific Coasts and Great Lakes Being Formulated

REAR-ADMIRAL ROBERT E. PEARY, who has been authorized by the Aero Club of America to appoint a committee to formulate working plans for an Aero Coast Patrol System for the Atlantic and Pacific Coasts and the Great Lakes, has notified the Board of Governors of the Aero Club that the following gentlemen have accepted membership on the Central Committee, which is to have its headquarters in Washington:

U. S. Senator Charles F. Johnson, of Maine, member of the Committee on Coast Defense and Naval Affairs, who was foremost in the movement which resulted in Portland, Maine, raising \$10,000 for establishing the first station of the Aero Coast Patrol System;

U. S. Senator Morris Sheppard, of Texas, member of the Committee on Military Affairs and Coast Defenses;

Congressman Julius Kahn, of California, member of Committee on Military Affairs, who is interested in establishing a chain of Aero Coast Defense Stations on the Pacific Coast;

Hon. Byron R. Newton, Assistant Secretary of the U. S. Treasury, who is the head of the Coast Guard and Life Saving Service, and recognizes the possibilities of training coast guards and life savers in aviation.

Hon. E. Lester Jones, Superintendent of the U. S. Coast and Geodetic Survey, and one of the brilliant young men of the administration, who is personally and intimately familiar with both coasts of the country;

Professor H. C. Frankfield, Chief Forecaster, U. S. Weather Bureau, who realizes that while weather forecasts will greatly assist air travellers, the Weather Bureau will be able to extend its work and increase its efficiency by co-operating with airmen;

John Hays Hammond, Jr., the inventor of the wireless controlled torpedo and other revolutionary inventions, and originator of the Aero Coast Patrol idea;

Hon. Emerson McMillin, the New York banker, who fostered the development of the Aero Coast Patrol System and the National Aeroplane Fund in the past six months by offering to add \$100 to every \$900 raised, up to \$500,000.

The following have been appointed State members of the Central Committee:

Col. C. J. Hubbard, Adj. Gen. Alabama Militia; Col. Chas. W. Harris, Adj. Gen. Arizona Militia; Brig. Gen. Lloyd England, Adj. Gen. Arkansas Militia; Col. C. W. Thomas, Jr., Adjutant General and Captain George W. Bauer, of the California Militia; Brig. Gen. John Chase, Adjutant General Colorado Militia; Brig. Gen. Geo. M. Cole, Adjutant General, and Commander Ebenezer Hill, Jr., of the Connecticut Militia; Brig. Gen. I. P. Wickersham, Adjutant Gen., Delaware Militia; Maj. Joseph C. Castner, Adj. Gen. and Commander J. A. Dempf, D. C. Militia; Maj. Gen. J. C. R. Foster, Adj. Gen. and Lieut. Commander Geo. B. Graham, of the Florida Militia; Brig. Gen. J. VanHolt Nash, Adj. Georgia Militia; Col. John W. Jones, Adj. Gen. Militia of Hawaii; Brig. Gen. Philip Crow, Adj. Gen. Idaho Militia; Brig. Gen. F. S. Dickson, Adj. Gen. and Capt. E. A. Evers, of the Illinois Militia; Brig. Gen. F. L. Bridges, Adj. Gen. Indiana Militia; Brig. Gen. Guy E. Logan, Adj. Iowa Militia;

Brig. Gen. Chas. L. Martin, Adj. Gen. Kansas Militia; Brig. Gen. J. Tandy Ellis, Adj. Gen. Kentucky Militia; Brig. Gen. O. W. McNeese, Adj. Gen. and Capt. J. W. Bostick, of the Louisiana Militia; Brig. Gen. G. McL. Presson, Adj. and Commander Reuben K. Dyer, of the Maine Militia; Brig. Gen. and Commander Ralph Robinson, of the Maryland Militia; Brig. Gen. Chas. H. Cole, Adj. Gen. and Capt. John T. Nelson, of the Massachusetts Militia; Maj. Roy C. Vandercok, Adj. Gen. and Commander J. F. Lewis, of the Michigan Militia; Brig. Gen. Fred B. Wood, Adj. Gen., and Commander Guy A. Eaton, of the Minnesota Militia; Brig. Gen. Eric C. Scales, Adj. Gen. Mississippi Militia; Brig. Gen. John B. O'Neera, Adj. Gen., and Commander G. F. Schwartz, of the Missouri Militia; Brig. Gen. Phil. Greenan, Adj. Gen. Montana Militia; Brig. Gen. P. L. Hall, Jr., Adj. Gen. Nebraska Militia; Brig. Gen. Gilbert C. Ross, Adj. Gen. Nevada Militia; Brig. Gen. Chas. W. Howard, Adj. Gen. New Hampshire Militia; Brig. Gen. W. F. Sadler, Jr., Adj. Gen. and Commander Edward McC. Peters, of the N. J. Militia; Brig. Gen. H. T. Herring, Adj. Gen. New Mexico Militia; Brig. Gen. L. W. Stotesbury, Adj. Gen. and Commodore R. P. Forsheew, of the New York Militia; Brig. Gen. L. W. Young, Adj. Gen., and Capt. C. D. Bradham, of the North Carolina Militia; Brig. Gen. T. H. Tharalson, Adj. Gen. North Dakota Militia; Brig. Gen. B. W. Hough, Adj. Gen., and Commander A. F. Nicklett, of the Ohio Militia; Brig. Gen. F. M. Canton, Adj. Gen. Oklahoma Militia; Brig. Gen. G. A. White, Adj. Gen., and Lieut. Commander G. F. Blair, of the Oregon Militia; Brig. Gen. T. J. Stewart, Adj. Gen., and Commander T. T. Nelson, Jr., of the Pennsylvania Militia; Brig. Gen. C. W. Abbott, Jr., Adj., and Commander W. C. Bliss, of the R. I. Militia; Brig. Gen. Wm. W. Moore, Adj. Gen., and Lieut. Commander C. L. DuBois, of the South Carolina Militia; Brig. Gen. W. A. Morris, Adj. Gen. South Dakota Militia; Brig. Gen. C. B. Rogan, Adj. Gen. Tennessee Militia; Brig. Gen. H. Hutchins, Adj. Gen. Texas Militia; Brig. Gen. E. A. Wedgwood, Adj. Gen. Utah Militia; Brig. Gen. W. W. Sale, Adj. Gen. Virginia Militia; Brig. Gen. John C. Bond, Adj. Gen. W. Va. Militia; Brig. Gen. Geo. M. Sliney, Adj. Gen. Wyoming Militia; Brig. Gen. L. S. Tillotson, Adj. Gen. Vermont Militia; Brig. Gen. Maurice Thompson, Adj., and Capt. W. Frank Andrews, of the Washington Militia; Brig. Gen. Orlando Holway, Adj. Gen., and Lieut. Commander Theo. Werder, of the Wisconsin Militia.

The Presidents of the twenty-seven aero clubs affiliated with the Aero Club of America are also appointed members of this Committee.

President Wilson, Secretary Daniels and Secretary Garrison approved this plan as soon as it was proposed.

While every effort will be concentrated first on establishing a chain of aero coast patrol stations along the Atlantic Coast and the Pacific Coast and on the Great Lakes, at intervals of 100 miles from each other, stations are to be established also in the interior, so as to interconnect the east to the west, the north with the south, every Militia center becoming an aero patrol station. In case of danger a station on one of the seaboards can instantly advise the entire country of the impending danger.

The plan of the Aero Coast Patrol is to divide our entire coast lines into sections of convenient length, say about one hundred miles, and in each of these sections establish a sta-

**America Must be Given a Navy Equal to the Best.** If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.



tion where there will be erected a suitable hangar for housing a seaplane and an equipment sufficient to make all minor repairs, with several larger stations at intervals where all more complicated repairs can be made or a complete overhauling given at regular intervals.

Each of these sections and stations will be equipped with a seaplane. Each of these machines would carry a driver and an observer and be equipped with light wireless apparatus, powerful glasses and a sensitive microphone.

When in active operation these seaplanes in each section would take their position some fifty miles off shore, and patrol their respective beats continuously back and forth. In clear weather they will fly at two thousand feet or more above the sea, from which altitude ships fifty miles distant may be seen. At night or in fog, seaplanes would of course sweep much lower, at all times themselves invisible to an enemy.

By means of the wireless, information as to the character, number and apparent destination of approaching ship or ships would be transmitted to the shore station and from these to Washington, whence, if the ships were hostile, orders would be issued directing the movements of our fleet and the submarine squadrons for the preparation of the coast defenses and for the concentration of troops, if necessary, while reserve planes, hurrying out, would keep the approaching craft under continuous inspection while themselves invisible.

Such a system is a new departure. The like of it exists nowhere at present, and yet it involves no new principle, but is simply the utilization and multiplication of the known capabilities of a single seaplane.

A great attraction of the system is that its value as a peace asset is fully worth its cost even if we never have occasion to use it as a military asset.

It will be, under such circumstances, a natural and valuable adjunct of the coast guard and life-saving service. The partly submerged derelict, too light to sink and a constant menace to traffic, would be spotted by the aerial scout and its presence reported. Wrecks, vessels in distress and all other marine incidents and accidents, would be reported and aid quickly summoned when necessary.

But if ever war should arise, the first value of this coast patrol service would be the prompt report, "Ready and equipped for service," from a hundred or more trained flyers and observers, from mechanics and helpers organized into a state of military readiness.

In war times the patrol could weave such a continuous off-shore curtain of observance around our entire coasts as would make surprise attack in force an impossibility. The chance of a scout-ship, a destroyer, or a cruiser escaping observation would be exceedingly small; and even a submarine, although submerged, might not escape the eye of the seagull soaring above it.

The present idea of the system is that the patriotic citizens of our coast communities shall furnish the funds for the equipment of the stations of the system and that the upkeep and maintenance of these stations will devolve upon the Naval Militia of the Coastal States.

Stations of the Aero Coast Patrol System are being established as follows:

In New York, in connection with the aviation sections of the National Guard, and the First and Second Battalions of the Naval Militia, each of which have been presented with aeroplanes through the National Aeroplane Fund; and in Buffalo, under the auspices of the Militia and Aero Club of Buffalo, which has raised \$10,000 for this purpose.

In Maine, under the auspices of the Militia and the Chamber of Commerce of Portland, which has raised \$10,000 for the first station.

In Rhode Island, under the auspices of the Militia, \$22,000 having already been subscribed.

In New Jersey, under the auspices of the Militia, an hydro-aeroplane and training for officers having been presented.

In Massachusetts, under the auspices of the Militia and the Aero Club of New England, Messrs. Godfrey L. Cabot, Charles Fearing, Norman Cabot, and other prominent Bostonians have acquired two powerful seaplanes, and an additional fund of \$10,000 is being raised. The Burgess Company has also put its own aeroplane station at the disposal of the Militia.

In Michigan, under the auspices of the Militia and the Aero Club of Michigan, which is raising a fund, which already amounts to \$12,000.

In California, under the auspices of the Militia and the Aeronautical Society, an aeroplane having been presented recently by Glenn L. Martin, and a fund of close to \$2,000 having been contributed to the National Aeroplane Fund. The Curtiss Co. has also put its aeroplane station at North Island at the disposal of the Militia.

In Illinois, under the auspices of the Militia and the W. H. Cochrane Syndicate, of Chicago, which has underwritten \$100,-

000 for the development of the aerial defenses and training of aviators.

In Virginia, under the auspices of the Militia, a \$10,000 fund being raised for the purpose, half of which has already been subscribed. The Atlantic Coast Aeronautical Station, located at Newport News, has also put its facilities at the disposal of the Militia.

#### Inland States Equipping.

Inland states working toward a similar end are organizing aerial forces as follows:

In Pennsylvania, under the auspices of the Militia and the Aero Club of Pennsylvania, two of whom, Messrs. Robert Glendinning and Clarke Thomson, will contribute the use of their flying boats for this purpose.

In Washington (State), under the auspices of the Militia and the Aero Club of the Northwest, the members of which will loan the use of three seaplanes for this purpose.

In Colorado, under the auspices of the Militia and the Colorado Aero Club, a \$10,000 fund is being raised, one-third of which has already been raised.

In Missouri, under the auspices of the Militia and the Missouri Aeronautical Society, which is raising a fund of \$20,000 for that purpose.

In Iowa, under the auspices of the Militia and the Aero Club of Iowa, \$10,000 having been raised by the latter. The Grinnell Aeroplane Co., of Grinnell, has offered its facilities for a station.

#### Monster Rally at Carnegie to Forward Interests of Aerial Defense.

TO raise funds towards training 5,000 aviators and to indorse the program for universal military training, the National Special Aid Society jointly with the Aero Club of America will hold a National Defense Patriotic Rally in Carnegie Hall on February 23.

"With 5,000 trained aviators," said Mr. Alan R. Hawley, president of the Aero Club of America, "this country would be in the position of the porcupine, which goes about its peaceful pursuits, harms no one and yet is ever ready to defend itself. We have less than twenty aeroplanes in the Army and Navy, and the program is being considered by Congress only to provide for less than 100 aeroplanes. No provision has been made to equip the Militia with aeroplanes. Therefore, it having developed that the Government has been criminally negligent in this respect, it has devolved upon patriotic citizens to meet this situation. With general co-operation it is believed that 1,000 aviators can be trained this summer."

"When the problems of immediately improving the national defenses are considered," said Mr. Henry Woodhouse, governor of the Aero Club, "it is found that aeronautics affords possibilities for quick developments and immediate relief at only a fraction of the cost of developing other arms. Of all the weapons produced by this war the aeroplane is most efficient. It protects, it destroys, it fights. It is the super-spy, super-scout and super-belligerent."

In endorsing the program provided for universal military training the officers of the National Special Aid Society gave thorough consideration to the subject," said Mrs. Alexander, "and found that it affords the natural solution to the problem of getting trained men necessary for national protection. It was also found that military training would be an important factor in developing the character and physical strength of the youth of the country. From a business standpoint, young men who have had the advantage of military training are much more desirable, the training developing obedience and responsibility which cannot be developed otherwise. Therefore it is desirable from every standpoint."

Among the speakers will be Henry A. Wise Wood, chairman of the Conference Committee on National Preparedness; S. Stannard Menken, president of the National Security League; Mrs. Linden W. Bates, head of the Women's Section of the Civic Federation of America; John Hays Hammond, Jr., the inventor of the wireless controlled torpedo, and other revolutionary inventions, and the originator of the aero coast patrol idea; G. Douglas Wardrop, member of the Aero Club of America, and American Society of Aeronautical Engineers, and editor of AERIAL AGE WEEKLY.

An important feature of the evening will be a presentation by thrilling films and exclusive slides of the war in the air with comment by Mr. Wardrop. These films and slides will show such important phases of war as air reconnaissance and observation, bomb dropping, submarine spotting, submarine destruction, air duels, the part which the Zeppelin has played in the war, use of wireless on aircraft, the use of the aerial torpedo, construction of aircraft, looping-the-loop, cities as seen from the aeroplane. A special film has been prepared for this meeting by the Thomas Brothers Aeroplane Company, of Ithaca, showing stretches of the country in the neighborhood of Ithaca, taken from the Thomas Military Tractor a few days ago.



# THE NEWS OF THE WEEK

## A New World's Altitude Record

Capt. Arthur S. Cowan, Chief of the Signal Corps Aviation School, U. S. A., at San Diego, has announced a new world's altitude record for a hydro-aeroplane, with two passengers and pilot.

The record was made at San Diego on February 11, by Floyd Smith, a civilian aviator, who attained a height of 9,544 feet. Captain Cowan, who represented the Aero Club of America at the flight, found that the barograph strapped to Smith's machine showed that it had ascended 544 feet higher than the altitude of 9,000 feet, recorded by the pocket barograph Smith carried.

## Thomas Aviation Motor Completes Test

The Thomas 135-h.p. aviation motor has just been subjected to a seven and one-half hour test, at full load, 2,000 revolutions per minute. The test was preliminary to the Navy Department trials and was observed by a Navy Department inspector and by a representative of the Aero Club of America. The test was entirely successful. The gasoline consumption during the period was thirteen and one-half gallons per hour.

## Asks \$300,000 for Pacific Coast Aviation School

Major General Scott, Chief of Staff, and Acting Secretary of War, has recommended to Congress that an appropriation of \$300,000 be made for the establishment of a School of Aviation at Coronado Beach, California.

The recommendation came in the form of the report of three army officers who had been detailed to investigate sites on the Atlantic, the Pacific and the Gulf coasts for aviation training. In the opinion of this board, San Diego Bay is the best place in the country for the location of such a school.

"The terrain in the vicinity of San Diego Bay fulfills the conditions required better than any other section of the United States," said the report.

"Study of the climatological data of the locations visited by the commission clearly showed that the littoral of San Diego Bay contains the best sites as far as weather and air conditions are concerned. Rail and water connections at San Diego are ample for transportation and communication, while the country in that vicinity possesses characteristics found nowhere else."

## Packard Field a Landing Place for Tourists

In anticipation of the eventual use of the aeroplane for touring purposes the Packard Motor Car Company, which recently acquired a large tract of land near Mt. Clemens, Mich., for a flying field, will make this field available for the comfort and convenience of those who travel by air. It will be equipped with hangars, a supply depot and a repair shop, and in short will become an aviation centre for aerial voyagers, as well as a flying field and testing place for the aerial department of the Packard Company.

## National Advisory Committee for Aeronautics

At the meeting of the Executive Committee of the National Advisory Committee for Aeronautics it was decided to prepare and issue general specifications covering the requirements of aeronautics in the lines of indicating instruments for the navigation and operation of aircraft.

The annual report of the Advisory Committee is now in the hands of the Public Printer at Washington and it is expected that it will be issued in the near future.

## Aero Mail Bids Asked for Eight Routes

For the dual purpose of improving the mail service and for stimulating the aeronautics so that they may be available in case the nation needs them as experienced aviators, with aeroplanes, the Postoffice Department at Washington has asked for bids for carrying mail by aeroplanes on eight routes, seven of which are in Alaska and the eighth in Massachusetts.

On the Massachusetts route the government is now spending \$23,000 a year and on some of the routes in Alaska for which aeroplanes will be used the government is now spending as much as \$100,000 a year to get the mails carried, and even at that figure the service is necessarily limited on account of the severity of the winters. So in view of the sums that are now being paid for what is an inferior service Postmaster General Burleson feels that bids for the eight routes will be forthcoming. He says that capital is already considering bids and estimates are being made. The Postoffice Department was encouraged to take this step on account of the pronounced public interest in the aeroplane as evidenced by popular support of the movement to equip the nation with aeroplanes that will serve it in time of need.

The Alaska routes will apply the severest possible test to the service and if the results on the eight routes are satisfactory the department will gradually extend the aerial service to cover all routes where it can be used with extraordinary advantage over the means of transmission now employed. As the utilization of the aeroplane in carrying mails offers almost unlimited possibilities the aeronautic industry regards the action of the Postoffice Department as the opening of a new era in aviation, as well as a new era in the transmission of intelligence.

The Massachusetts route is from New Bedford to Nantucket, fifty-six miles and return, partly by land and partly by water. Trips would be made thirteen times a week during the summer months and six times in the winter. An aeroplane would have to be able to carry a weight limit of 3,000 pounds.

The Alaskan routes form a connecting link from Seward to Nome, thence to Fairbanks and back to Valdez. Most of them call for a service twice a week throughout the year. On some of the routes in winter six weeks is required to make the trip. The aeroplane contracts allow two days for most of the trips. The longest route—Valdez to Fairbanks—is 358 miles. The extreme time limit of six weeks on some of the routes is required because mail sometimes has to be routed via Seattle.

The biplane presented to the Naval Reserve of New Jersey, by Inglis M. Upperco, President of the Aeromarine Plane & Motor Co., which is now on exhibition at the Newark Automobile Show.





**Ten Curtiss Triplanes Ordered by British Government**

The British Government has just placed an order with the Curtiss Aeroplane Company, of Buffalo, for ten torpedo-carrying hydroplanes of a type never used before in aerial warfare. The new machines will carry six men, four rapid-firing guns, and a gun capable of throwing a shell 32 inches in diameter.

The new machine, of which one has been practically completed, is several times greater than any now in use in Europe. The most novel feature of its construction is that it has three planes instead of two, as have the other big machines now part of the equipment of the Royal Naval Aviation Corps.

Its size places it in a class by itself. The wings are 133 feet over all and the body of the machine is 68 feet long. The fixed tail horizontal is 126 square feet and the rudder 54 square feet. The hull of the hydroaeroplane weighs 8,000 pounds and its motors close to 4,000. The estimates on which the order was obtained from the British Government, and which are based on actual performances, call for a crew of eight men, weighing 1,200 pounds, gasoline and lubricating oil weighing 5,250 pounds, and a dead-weight load of bombs of more than 3,000 pounds.

The motor equipment is widely different from anything now being used, even by the greatest German or Russian aeroplanes. There are four motors of 250 horsepower each, making a total of 1,000 horsepower, and these will drive two tractor propellers and one pusher propeller, set at the rear of the machine. The machine fully equipped will weigh about 21,000 pounds and a minimum speed of 75 miles an hour with its full load is called for. With fewer men and several hundred pounds less load, it is estimated that it will make 100 miles an hour, and will have a cruising radius of about 750 miles.

The three screws or propellers give a wonderful speed in climbing, and for this reason it is expected that the new triplane will be wonderfully efficient in chasing Zeppelins. It will be able to rise to their favorite altitude of never less than 10,000 feet, with speed enough to catch them before they have become lost. Once in the air, with a speed of close to 100 miles an hour, for the triplanes will not be carrying the large, heavy bombs when on this service, they should soon overtake a midnight raider. Their great mobility will then give them the supreme advantage and shells from the 3½-inch rapid-fire gun are likely to explode the Zeppelin. As these triplanes are water boats, they will not fear the Channel and will be able to follow their quarry almost to the home hangers.

One of the newest features of the triplanes is an ordinary screw propeller driven by a sixty-horsepower motor, which will be used when they are on the surface of the water. They will be able to make fair speed with this and will be able to maintain enough headway to always keep under the control of the pilot. This screw propeller will also make it possible for the machines to be easily brought into harbor and placed on their "mother ships."

**Military Aeroplane at the Newark Automobile Show**

The Aeromarine Plane & Motor Co., manufacturers of the aeroplane which Mr. Inglis M. Uppercu has donated to the New Jersey State Naval Reserve, have accepted an invitation to exhibit the plane at Newark Automobile Show February 19-26. The machine is exhibited completely assembled and ready for flight with the land landing gear attached.

The machine is suspended above the Armory floor and one of the Aeromarine Plane & Motor Company's six-cylinder vertical motors, military type, was installed in a prominent place on the exhibition floor.

Ensign Stover, of the New Jersey State Naval Militia, has a number of the officers and men of the corps at the exhibit.

At the expiration of the show the machine will be taken to the hangars at Hempstead, where it will be tried out under the management of Mr. Albert Heinrich. When the machine has been officially presented to the Naval Reserve it will be in personal charge of Ensign Stover, who has engaged the services of Captain Janney, a noted military pilot.

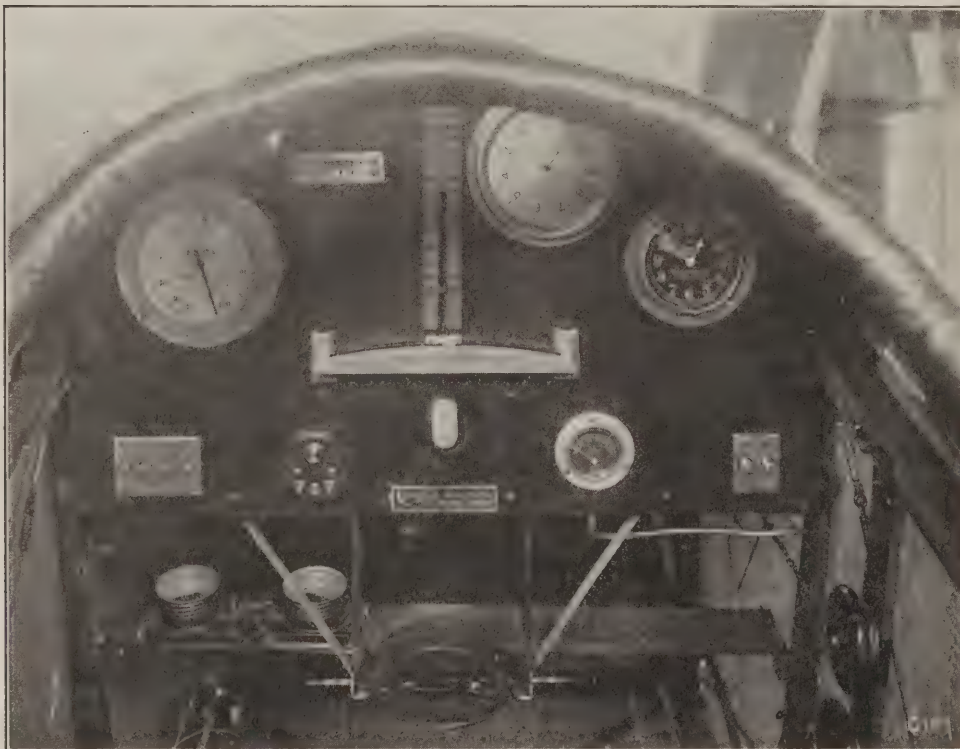
The dedicatory ceremony will be held at the headquarters on board the S. S. Adams, Hoboken, N. J., at a date to be determined later. All the prominent state and county officials will be present on this occasion. When this machine is officially turned over to the state it will probably have the water landing gear attached, as suitable arrangements have been made for launching from after deck of S. S. Adams.

**Neil Mac Coull With the Westinghouse.**

Neil MacCoull, of the staff of contributing editors of *AERIAL AGE*, has accepted a position in the engineering department of the Westinghouse Machine Co., Pittsburgh, Pa., a branch of the Westinghouse Electric & Manufacturing Co. In his new connection, however, he will continue to be a member of the *AERIAL AGE* staff, supplying technical papers embodying the results of original research work in aeronautics.

**Miss Stinson Loops in Chicago**

Miss Catherine Stinson looped-the-loop in Chicago Wednesday, February 16. Once in the afternoon and once in the evening she ascended in Grant Park and demonstrated her control to watching Chicagoans—and, incidentally, to the delegates to Showman's Convention, which was in session. In the evening she executed the loop with attached fireworks. This was the fifth and sixth times she has performed this feat in Chicago.



The instrument board of the standard Curtiss military tractor biplanes.



### Government May Purchase the Hammond Control

Advices from Washington are to the effect that John Hays Hammond, Jr., made a profound impression on some of the members of the House Committee on Appropriations when he appeared before them to explain his invention by which the course of a torpedo can be controlled by wireless from an aeroplane at any altitude, or from the shore. Through the use of this control every torpedo launched would be practically sure of hitting the mark aimed at.

Although the United States Government has repeatedly refused to purchase inventions for war purposes, thus giving possible enemies of the nation an opportunity to get devices of great utility, there is a probability that in the case of the Hammond radio control the Committee may break the rule and recommend the purchase of Mr. Hammond's invention.

### Flights at the San Diego, Cal. Station

The flying records of the United States Signal Corps Aviation School, at San Diego, Cal., for 1915, present a number of interesting features. There were 1,628 passengers carried, and a total of 3652 flights made with a duration of 1516 hours 19 minutes in the air. A conservative estimate gives a total distance of over 95,000 miles covered by Army machines at the school during the year. There was an average of seven machines in commission each month during the year.

The First Company, Second Aero Squadron, left the school January 2, sailing for the Philippines from San Francisco January 5 on the transport *Sheridan*. Two of the large Martin Model S seaplanes for this company were not ready in time to be sent with the company. They have since been tuned up, tested and accepted and were sent on the February 5 transport. First lieutenant Shepler W. Fitzgerald, who practiced with the machines after their acceptance, sailed on the same transport.

Although there was little flying during the Christmas holidays 427 flights were made during December; duration 187 hours 48 minutes; 167 passengers carried. During the month of January Lieutenants Curry, Brown, Richards and Royce, Sergeant Adamson and Corporal Biffle passed their tests for pilot's license. The above officers will probably receive their junior military aviator tests about March 1.

Two classes of six officers each completed their course in practical motor work under Mr. Hallett February 5, and another class of six officers started in this course February 7. The first course in aeronautical engineering for the new year began February 7 with Captain Clark as instructor. Seventeen student officers are taking this course.

There are 23 student officers and 7 non-commissioned officers undergoing instruction in flying at the present time. During January the following officers started flying alone: Second Lieutenants George H. Brett, Sheldon H. Wheeler and George E. A. Reinburg. During the same months Second

Lieutenants John W. Butts, Leo G. Hefferman, John C. P. Bartholf, Clinton W. Russell, Howard C. Davidson and Maxwell Kirby reported at the Signal Corps Aviation School for duty as aviation students.

### Dr. Lucke Talks to Militia Aviation Section

On Monday evening, February 14, aboard the U. S. S. Granite State, Dr. Charles E. Lucke, Professor of Mechanical Engineering of Columbia University, gave an interesting lecture on the development of Internal Combustion Engines for use in aeroplanes and war craft.

The lecture was attended by the Engineer's Division and the Aviation Section of the First Battalion, New York Naval Militia. Great interest was shown by the Aviation Section, as Professor Lucke gave the actual results of many of the Internal Combustion Engines that are being manufactured in the United States and abroad, and being used in the great war.

Those interested in aviation in connection with the Naval Militia, will find it very interesting to pay a visit to the Aviation Section on board the U. S. S. Granite State, on any Monday evening, and become familiar with the work the Section is accomplishing toward placing this branch of the Service in readiness.

### Wardrop Lectures at Syracuse University and Technology Club

On Monday of last week, G. Douglas Wardrop, Managing Editor of AERIAL AGE, addressed the students of Syracuse University on the tremendously important part which aircraft have played in the European war, and the important lesson which we should gather therefrom. Mr. Wardrop especially called the attention of the technical students present to the wide field which this new industry presented to them for their energies, a field which was rich in possibilities from a commercial, as well as a scientific, standpoint.

In the evening, Mr. Wardrop addressed a very largely attended meeting of the Technology Club. The members were tremendously interested in the illustrations which the lecturer showed, and in the romantic story which he had to present. They were all keenly appreciative, also, of the great task which lay before patriotic citizens in getting this country to assume an attitude of internationalism in aerial preparedness consistent with our importance as a nation. The many questions asked after the lecture indicated a very lively interest in the subject amongst the members.

### Flushing Men's Club Hears Aircraft Lecture

The members of the Men's Club of the First Congregational Church of Flushing, L. I., turned out in full force Tuesday evening to hear G. Douglas Wardrop, Managing Editor of AERIAL AGE, lecture on "The War in the Air." Much interest was manifested in the pictures, and in the message which the lecturer conveyed.

Flashlight photo of Thomas 135 H.P. Aero-motor after completion of 7½ hour full load run preliminary to Navy Department tests. Gasoline consumption, 13½ gallons per hour. Present at tests: J. J. Frawley, representing Aero Club, and Engineers Bliss and Abel.





## RECENT EXPERIMENTS IN AERODYNAMICS

THE Smithsonian Institute has just issued an illustrated pamphlet containing a series of technical reports on experiments recently conducted in the wind tunnel for aerodynamics at the Massachusetts Institute of Technology, at Boston, Mass.

In writing on this wind tunnel itself, J. C. Hunsaker, assistant naval constructor, U. S. N., and instructor of aeronautics at the institute, says that since it is difficult to carry on full scale experiments to investigate the aerodynamical characteristics of a proposed air-craft design, tests are made on small models, as in naval architecture. The experiments are further simplified by holding the models stationary in an artificial current of air with a maximum wind speed from 34 to 40 miles an hour, instead of towing them at high speeds through still air to stimulate actual flying conditions.

After a study of the principal aerodynamical laboratories of Europe, it was decided to reproduce at Boston the four-foot-diameter wind tunnel of the National Physical Laboratory of Teddington, England, together with the aerodynamical balance and instruments used there for measuring velocity. In this connection the director of the English laboratory generously presented the detailed plans of the complete installation to the Massachusetts Institute of Technology. Mr. Hunsaker describes the wind tunnel, the aerodynamical balance, and explains some of the experiments and principles involved.

The second article of the series comprises notes on the dimensional theory of wind tunnel experiments, by Edgar Buckingham, of the U. S. Bureau of Standards, who defines the theories and principles involved, and suggests standardization of the methods employed.

In another report Mr. Hunsaker discusses the most common and convenient form of pressure anemometer, known as the Pitot tube, an instrument used in calculating the wind velocity from the pressure differences. He also describes the construction of an inclined manometer, a form of pressure gauge, used in the experiments.

Messrs. H. E. Rossell and D. W. Douglas report on their experiments concerning the adjustment of the velocity gradient across a section of the tunnel. Since in wind tunnel experiments it is essential that the velocity of the air striking different parts of the model under test, shall be the same, it was necessary after developing precise methods for measuring the velocity, to explore the cross-section of the tunnel to detect variations in velocity from point to point. The results

of their experiments and the effects secured by the adjustment of a honeycomb grating, which straightened out the flow of air, are recorded.

Tests of the characteristic curves for wing sections are discussed by Messrs. H. E. Rossell, C. L. Brand and D. W. Douglas. They experimented with and tested the aerodynamical constants published by the British Advisory Committee for Aeronautics for wing profile R. A. F. 6, and found the results to be sufficiently precise for purposes of aeroplane design.

J. C. Hunsaker discusses stability of steering of a dirigible, citing some of his experimental tests with a wooden model of a dirigible hull fitted with rudders and fins in accordance with regular practice. It is now possible to base the design of fin and rudder area upon his data instead of "rule of thumb." His experiments proved that with the size rudder and fin fitted (7.79 and 3.47 sq. in.), the ship could be held on its course by the use of not more than  $16\frac{1}{2}$  degrees of rudder. The importance of a vertical rudder was proved, but it was found impossible in practice to give sufficient vertical fin area to hold the ship on its course without the use of the helm.

The pitching and yawing moments on a model of a Curtiss aeroplane chassis and fuselage, complete with tail and rudder, but without wings, struts or propeller, are set forth in an article by Messrs. Hunsaker and Douglas.

Swept back wings are discussed by Messrs. Rossell and Brand, who maintain that with a sweep back of 10 degrees an appreciable righting moment may be expected without change in any of the other aerodynamical properties of the straight wing.

In order to ascertain whether the righting moment secured by swept back wings as investigated by Messrs. Rossell and Brand, could be better obtained by another method, Messrs. Hunsaker and Douglas experimented with dihedral angle wings. They maintain that the dihedral angle wings afford better results than the swept back wings, and since the former are built much more easily, it is believed that the dihedral is of more value for purposes of lateral stability. Attention is called to the fact that the "Langley aerodromes," built by the late secretary of the Smithsonian Institution, were equipped with dihedral angle wings, inclined upwards about 6 degrees.

The last article is by J. C. Hunsaker, and deals with critical speeds for flat discs in normal wind.

## AMERICAN AVIATOR'S TRICKS THROUGH JAPANESE EYES

By TOHA HACHINO\*

I AM greatly pleased to have this opportunity to report to the American public what a glorious success in aviation was attained by Mr. Charles Niles on December 11 and 12 in parade ground Aoyama Tokyo, to the indescribable amazement of 300,000 of Japanese spectators who have never expected or thought possible anything like such dangerous performances in such a tremendous height on such a frail and obstinate machine.

Before reporting what impression it made on the Japanese public, let me give a rough sketch of the actual scenes on the occasion. Numberless rows of chairs for the spectators were set along the enclosure of the immense parade ground which was at the same time decorated with innumerable flags representing different nationalities. The exit of the aeroplanes from the shelter was welcomed by the melodious musical performance of the military band.

At 2 o'clock His Imperial Highness Prince Higashi Kuni put in an appearance and was saluted by Lieutenant General Nagaoka and Mr. Jagawa, M. P., who were respectively appointed to be the president and vice-president of the committee hastily created for welcoming Mr. Niles. Hundreds of naval and military officers interested in aviation also attended the occasion.

In the meantime Mr. Niles appeared amid cheering of spectators on the scene in a plain aviation suit, apparently cheerful and light-hearted, but composed and self-collected. His manners indicated the great confidence he seemed to place in his capability to conquer any hostile air current that he may meet in the Japanese skies. A brief examination of the machine having been completed, he jumped on Bleriot monoplane which immediately made a steep ascent such as has never been seen in Japan, after running about 10 meters on the ground.

He first drew a large semi-circle along the enclosure of ground over the heads of the spectators, then from the

height of about 500 meters he dashed downward, halting on the ground with remarkable agility and lightness. At 2:40 he swung up again and then after making several rounds at the height of about 1,000 meters accomplished various dangerous feats with wonderful success, among which somersaults, backward and forward, and sidewise were most amazing.

Of all the attracting sights that I have seen in the past none surpassed in boldness and manliness and faultlessness what was displayed by Mr. Niles. The same must have been the case with all other spectators. Their cheers applause literally "shook the pillars of the firmament and the axis of the earth" (a familiar Japanese expression). For a moment they lost themselves in ecstasy of admiration over the incredible wonders they have for the first time seen displayed by an American. One and all, as if by previous arrangement shook their hats crying out like people who have gone crazy.

After about 10 minutes of successive performances Mr. Niles made an almost perpendicular dive from an altitude of about 200 meters directly toward the tent in which was Prince Kuni, exactly as if it were falling down. Every spectator held his breath with profound anxiety, but soon breathed a sigh of relief when the machine suddenly changed its direction at a point about 10 meters high from the ground and safely landed. Mr. Niles came down with a smiling expression, walked towards Prince Kuni, with whom he had the honor of shaking hands (a remarkable event in Japan for a blood-prince to shake hand with professional aviators). The prince uttered every eulogy imaginable and gave Mr. Niles a wreath as the token of his boundless admiration.

The second flight on a Curtis biplane was accomplished with a still greater success, overwhelming the populace with infinite amazement.

(Continued on page 554)

\* Courtesy N. Y. Sun.





# FOREIGN NEWS

By JAMES E. CLARK



## ALBANIA

It has transpired that when the steamship Brindisi struck a mine and was blown up in the Adriatic Ocean on January 6 some of the 400 persons aboard escaped death by drowning or by fire only to meet it later from aerial bombs. When the survivors, among whom were Dr. Guca and Miss Lamos, Americans, reached the Albanian shores at San Giovanni di Medua, Austrian aeroplanes were bombarding the port, and eight or ten of those who had managed to escape from the wreck lost their lives. Dr. Guca and Miss Lamos were not, however, injured.

## AUSTRIA

The war department announces that Austrian airmen have repeatedly bombed, with success, the troop camps near Durazzo and the Italian steamships lying in the harbor there.

## BELGIUM

There has been received in Amsterdam a story about the destruction of a monster Zeppelin at Ligne, Belgium. The dirigible was pursued by French aeroplanes, and in making a hurried landing it became entangled in wires and trees and collided with a building. While thus disabled the French aviators dropped bombs which destroyed the big airship and killed its German crew. Another version of the same, printed in an Amsterdam publication, is that two Zeppelins were lost near Aph, in Hainault—the first striking a tree while returning from the raid of January 30 on Paris, and the second being brought down by a French airman within a few miles of the same place.

## FRANCE

Instead of throwing bombs, some of the French aviators flying over German territory drop thousands of leaflets, according to a German newspaper, telling the German people that their hope of victory in the war is in vain. Thousands of toy balloons, each containing one of these leaflets, are freed daily when the wind is favorable to carry them into the German lines. There is also being distributed by the air route copies of a French newspaper, prepared behind the trenches, giving extracts from letters found on dead German soldiers in which the hopelessness of the German cause is admitted. This propaganda will, it is hoped by those back of it, cause discontent and unrest and add to the discouragement of the German people.

## GERMANY

Illustrating the chivalry of airmen there comes from Berlin a story about an aerial battle between a British and a German aeroplane. The German shot down his adversary, killing one of the two men aboard. The second man on the British plane was uninjured in person, but in landing his trousers were damaged beyond repair. To relieve the distress of the vanquished, the German victor mounted with his aeroplane and dropped a note into the British lines. An hour later an English flyer appeared and dropped a new pair of trousers for his comrade.

"The Zeppelin raiders on England on January 31 were all furnished with an apparatus for firing air torpedoes, similar to that in use on warships," says a dispatch from Copenhagen. "The range of the torpedoes is said to be about three and three-quarter miles.

"It is reported at Hamburg that the loss of the Zeppelin L-19 probably was not due to Dutch gunners, but to an accident caused by its flying low in order to fire torpedoes at warships."

Judging from the number of a new Zeppelin—LZ 95—which has just been undergoing trials at Friedrichshafen, Germany, it is thought that the Teutons now have eighty of these airships in service, as fifteen are known to have been lost. The new model is longer than the old ones, and is described as being fish-like in shape. It is tinted gray, so as to make it as inconspicuous as possible when flying. The gondolas are of plated steel. Each Zeppelin has six machine guns, apparatus for throwing bombs, and a new aerial torpedo, which will soon be used against the enemy.

There are rumors abroad that, in preparation for a great naval operation, in which the fleet at Kiel will be supplemented by a fleet of Zeppelins, marines are being withdrawn from other points and being sent to Kiel. Four Zeppelins and a flotilla of Taubes have been sent to the German naval base to reinforce the aircraft already there. The Germans are said to have equipped several new dreadnoughts with 17-inch guns, to have armed Zeppelins with a new type of aerial torpedo, and with this new equipment are about to make a startling sortie against England.

The Kiel authorities have published a warning concerning the action to be taken by the population of that German port in case of an aerial raid. A steam siren will give notice of the raid with a series of short shrieks lasting two minutes, and a similar notice will be given when the raid is over. The inhabitants of the city are urged not to expose themselves, as the Parisians did during the recent Zeppelin raid on the French capital.

## GREAT BRITAIN

Two German seaplanes, flying very high and so constructed as to be almost invisible, suddenly appeared out over the sea off the Kentish coast on the afternoon of February 6. They were headed inland. A few minutes later they flew over Ramsgate and Broadstairs. They dropped seven bombs between the two towns, which are close together.

"The first raider," says the official report, "appears to have selected for his target a tramway car full of women and children, and the first bomb fell on the road close behind the car and exploded without damage. The driver pulled up immediately and the passengers alighted. There was no panic, although the raider could be plainly seen circling round at a great height, and three more bombs were dropped in an adjoining field.

"The second raider made an attack on a large girls' school. One bomb fell through the roof and exploded in the upper story, doing some material damage. Portions of the ceiling fell into the room below, where a class of small children was being held. One little girl was slightly cut on the foot, and a maid was slightly injured.

"Three other bombs fell in the school grounds, where two exploded without damage. The third failed to explode. Two other

bombs were dropped on outlying parts of the town, causing slight material damage. A woman received some cuts on the cheek."

The county of Kent forms the southeastern extremity of Great Britain, running north to the Thames. It includes part of the city of London. This portion of the English coast was the object of the German attacks by aeroplanes, made on January 23 and 24, in which one person was killed and six were injured.

The creation of a Ministry of Aviation is part of the government's plan to meet the demand of the British people for better defenses against attacks from the air. The new Minister of Aviation will direct and co-ordinate the air services of the army and the navy and will be responsible for them to Parliament. The government in a forthcoming announcement to Parliament will stand by the position it has heretofore taken that the military value of the Zeppelin type of airship is insignificant and that the government sees no reason to imitate the action of Germany either by building more dirigibles or by instituting a policy of reprisals and employing war planes for the purpose of operating over the centres of population in the enemy's territory.

Claude Grahame-White, in an article in the Daily Express, predicts that in twenty years there will be a regular transatlantic aerial service by which it will be possible to go from London to New York in fifteen hours. The aeroplanes of the future will have many engines, widespread and multiple planes, a horse-power reckoned in thousands instead of hundreds, and these aeroplanes will have a speed of 200 miles an hour.

The Lord Chancellor, Lord Buckmaster, in a public address strongly condemns the suggested reprisals for Zeppelin raids. "There could be no greater tragedy in the black tragedy of this time than that," he says. "When we had conquered the Germans, we should have moulded ourselves and our behavior upon the very model we set out to break. This is not merely a war of armies, but of ideals."

During the "Zeppelin season," as the time when the weather is favorable for air raids is called in London, the museums and the art galleries will be closed by the order of the authorities and many of the more precious art objects and manuscripts have been removed to places of safety.

From British headquarters in France there has been issued a brief note telling of a raid participated in by eighteen aeroplanes against the huts of the enemy at Terhand, during which several of the huts were damaged and a steam lorry was struck by a bomb. All of the machines and the airmen participating in the raid returned safely.

## GREECE

The official report of the raid of February 1 on Salonica by a Zeppelin, issued by the French War Office, says: "Two projectiles were thrown on the Greek prefecture, and a third on the main office of the Bank of Salonica, which was completely destroyed by fire. The other bombs caused only slight material damage. The number of the victims among the civilian population was eleven killed and sixteen wounded, to whom must be added two soldiers killed and one wounded. An enemy aeroplane was brought down by one of our machines between Toppin and Verria (west of Salonica). The two aviators occupying the machine (a captain and a sub-lieutenant) were made prisoners."

The menace of the sword does not destroy all pleasure. In Salonica recently the Allied Racing Club held a big meeting while aeroplanes hovered in the sky and the roar of the great crowd assembled could almost be heard in the trenches of the enemy. The feature of the performance was the winning of the Kultur stakes by an Australian pony, Karaburno, in one minute and 40 seconds—a record eclipsing York's record of 1:41 at Johannesburg in 1914. This event was enlivened when an aeroplane appeared overhead, causing one of the horses to jump the fence.

## HOLLAND

On the assumption that the Zeppelin found to be in a sinking condition in the North Sea had been damaged by the fire of Dutch batteries, there is general satisfaction throughout the nation over the result, for Holland had protested against the violation of its neutrality by airships, and while the German government had promised to have the practice discontinued the violations had been kept up. When the Zeppelin which the Dutch batteries on the island of Ameland fired upon was first seen it was off Petten on the North Holland Coast. Coming from the sea it entered the three-mile limit. Continuing within the three-mile limit and flying low, it followed the coast line of the islands Texel, Vlieland, Terschelling and Ameland. It was, accordingly, fired on repeatedly by coast batteries and warships. The battery on the island of Ameland apparently hit the Zeppelin. The effect is uncertain, owing to the fog, but the Zeppelin immediately afterward vanished seaward.

It is understood the Ameland battery consists of ordinary field pieces adapted to anti-aircraft purposes.

The German Zeppelin, L-20, was in trouble off the west coast of Denmark on February 13. She tried to go south, but was unable to make headway on account of a strong wind and was driven back over the North Sea. Her engines seemed to be working badly.

## ITALY

On February 4, a new Italian observation aeroplane landed in Swiss territory after being fired upon, and repeatedly hit by Swiss guards. The aviator said that he had flown over Swiss territory by mistake. The Swiss newspaper, Thurgauer Zeitung, says that the aviator, Barbati, is a deserter, the first soldier to desert by air, and that the Swiss government has complied with the request of the Italian government to return him, and the aeroplane to Italian soil.

Fifteen persons were killed and a number of others, including several women and children, were injured when Austrian aeroplanes made a raid over Ravenna and the neighboring towns of Codigoro and Bottrighe, in northeastern Italy near the Adriatic on February 12. A hospital and the basilica Sant' Appolinaire were struck. Throughout Italy there is intense indignation over this raid, for it is declared that no possible military advantage could result from it. There are no fortifications of any kind in the vicinity.



## THE TWELVE-CYLINDER RAUSENBERGER AERONAUTICAL MOTOR

**P**REVIOUS to the manufacture of the 12-cylinder Rausenberger aeronautical motor, 8-cylinder motors were made exclusively; but feeling that the demand was for a higher powered, more perfectly balanced engine, the 12-cylinder was produced with the same successful results which have characterized these motors since early in 1910.

The Dayton Aero Motors Co., who are now constructing this motor, have one of their engines on the test stand at the Aeronautic Station in Washington. They have supplied us with the following information concerning their latest model:

Realizing that weight is an important factor, the 12-cylinder was designed so that there would be a maximum of safety and a minimum of weight. In this way the reliability and efficiency are made equal—both of the highest.

All parts and materials used in the Rausenberger motors are of the best obtainable, each having been tested out under the most severe conditions. It is to be noted also that many parts are standard, being of the highest grade and in general use on all the most successful aeroplane motors.

An example of the care and excellent workmanship used on these motors is the fact that every nut, bolt and small steel part, besides being machined all over, is heat-treated and case-hardened to prevent wear and fatigue. Also the motors are finished in white nickel or Cobalt plating.

From the point of view of design, every care has been taken to eliminate complicated parts, so that the engine may be inspected readily and kept in good condition. Everything is simple, strong and durable.

**Motor**—The motor itself is of the 12-cylinder, water-cooled, V-type, 4 cycle, with the cylinders set at an angle of 60 degrees. The bore is  $4\frac{1}{8}$  inch, while the stroke is 6 inch. The valves are all in the head, made of nickel steel and of largest possible diameter to insure quick action in the flow of gases. According to the most approved practice the valves are mechanically operated.

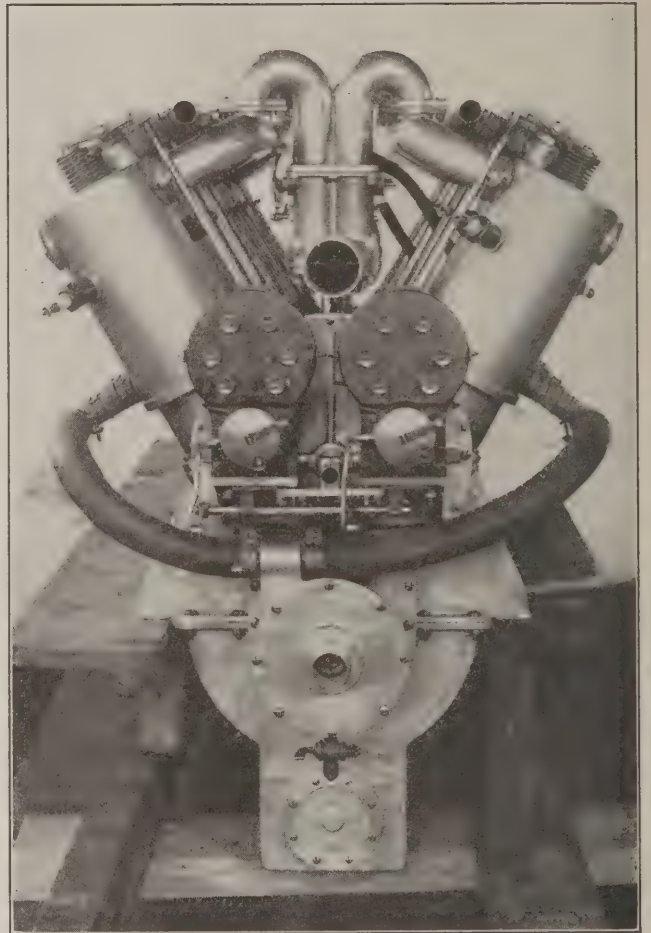
**Crankshaft**—The crankshaft is made from chrome vanadium steel, heat treated, hollow throughout with 7 main bearings. An extra bearing of liberal size is placed in the case extension. These bearings are all of Parsons white brass, held in place by large caps, and their ample size and number eliminates strains and lash. The bearings are held in place by two ( $\frac{3}{8}$ ) studs and under each nut is a flat machined washer to insure a good seat.

**Camshaft**—This is made from special alloy steel, with the 24 cams cut from the solid blank, hardened and ground to size. Like the crankshaft, it is supported by 7 bearings.

**Connecting Rod**—These rods are all forged from chrome vanadium nickel steel and are of the I beam type, all balancing at the same point. On the wrist pin end a bronze bushing is fitted, while at the crank end the caps are held by two special bolts, clamping the brass shims which hold the bearing in place.

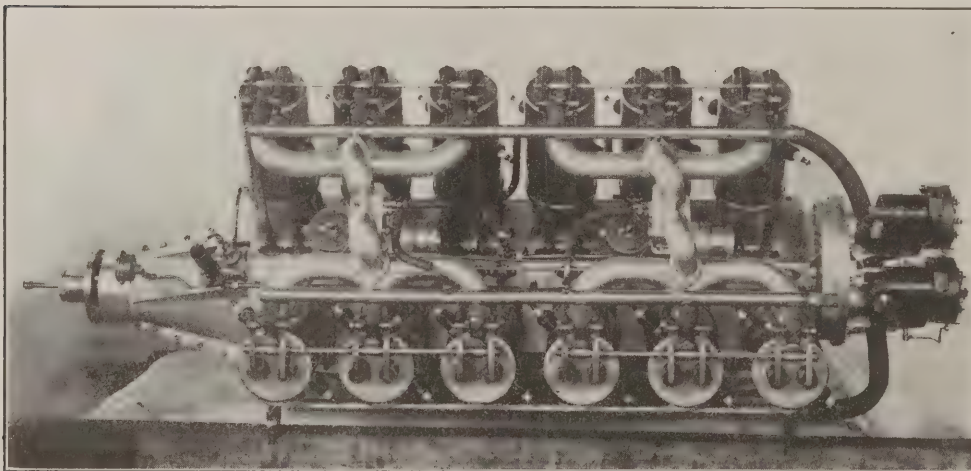
**Pistons**—Fine grained gray cast iron is the metal used in the manufacture of the pistons. These pistons are designed so as to give lightness, while at the same time to have ample strength. Their weight is  $2\frac{1}{8}$  pounds. Three double piston rings are used.

**Cylinders**—The cylinders are made of fine grained gray vanadium iron, bored and ground, and fitted with copper



jackets, securely fastened to prevent water leakage. This jacket covers the entire cylinder head, intake and exhaust ports. This method of water-jacketing does away with the trouble often experienced in hard, continuous running; namely, scaling of the exhaust valves and stems. The intake valves are surrounded by water, which is more or less cooled by its contact with them and the heat in the water helps to warm up the ingoing gas. Each cylinder undergoes an elaborate system of heat treatment.

**Crankcase**—As is the general practice, the crankcase is made of aluminum with heavy reinforcements, so designed that strains could have no effect. Great care has been taken to prevent oil leakage. On the front of the case a long extension is cast integral, which carries out the stream line effect and takes propeller strains from the crankshaft.



Top view of Rausenberger Twelve.



**Thrust Bearing**—At the end of the above extension is an S. K. F. radial self-aligning thrust bearing which can be used for either tractor or pusher mounting without change. The crankshaft is also at this point, allowing it to float free throughout the motor.

**Valve Tappets**—These have rollers working on cams. The push rods are solid, made from a special hard steel and provided with adjusting nuts.

**Rocker Arms**—These are forged from steel, machined all over and case hardened.

**Oil System**—Is of the return type actuated by two plunger pumps. One pump supplies all bearings with oil from a supply tank. From these bearings it goes to the splash basin, where the extra oil overflows through a filter to a small sump below the crankcase. In being pumped back into the supply tank by the second pump the oil is cooled. Plunger pumps, being simple in construction and most efficient, are used. These pumps are employed in order that the supply tank may be used below the motor or in any other desirable place. An oil pressure gauge is provided, so that it may be located in any convenient part of the aeroplane. All the oil lines are carefully arranged so as to prevent breaking, and wherever solder is used silver solder is employed.

**Water Circulation**—By a centrifugal pump driven direct from the end of crank shaft. The water pipe connections are hose with special clamps.

**Carburation**—Two double Zenith carburetors are used, so connected as to allow one carburetor for each three cylinders. In this manner short pipings are used and sharp turns eliminated. The manifold is water jacketed to promote better carburetion and greater efficiency.

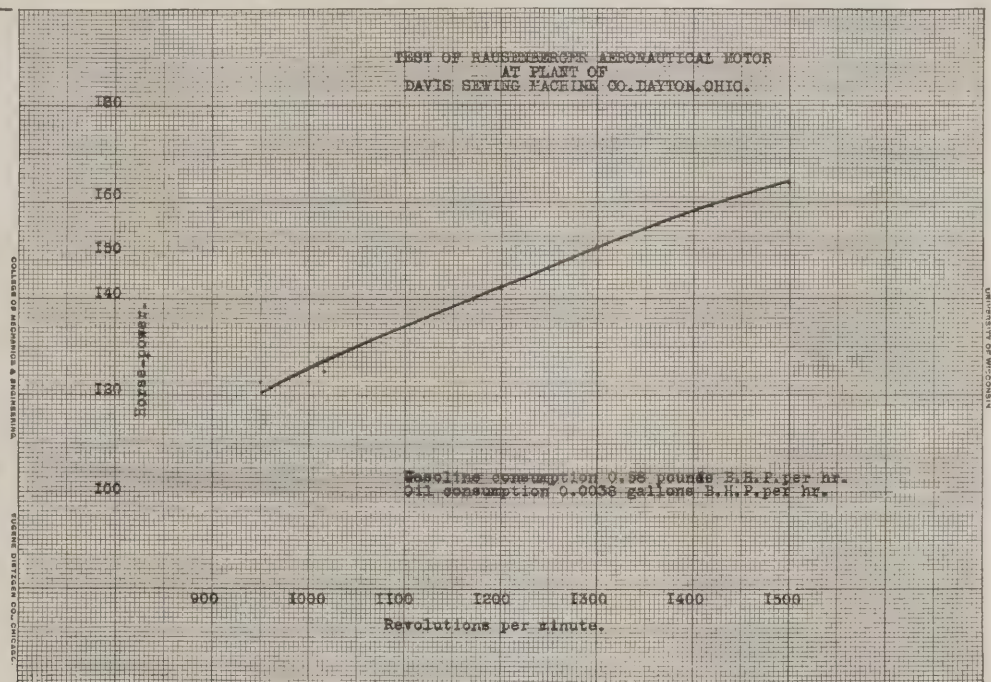
**Ignition**—Here two six-cylinder Splittorf magnetos are used. They are mounted on the gearcase and driven directly off of the timing gears. Bosch spark plugs and cables complete the standard equipment. The cylinders are made to take two spark plugs situated on opposite sides of the cylinder at a 45 degree angle from the square of the cylinder. This places the spark plugs where they are easily accessible. Two twelve-cylinder Splittorf magnetos may be used if desired.

**Propellor Flange**—This has eight propellor bolts and an extra plate to prevent losing the propellor.

**General Data**—Motor, 12-cylinder, 150 H. P. V. type,  $4\frac{1}{2} \times 6$  inches, 960 cubic inches piston displacement; water-cooled, valves in head; two double Zenith carburetors. Normal speed, 1,300.

**Dimensions**—Width, 24" over all; extreme length, 5' 10". Engine proper length, 42". Weight 570 lbs. without radiator. Delco self-starter provided if desired.

Power curve of the Rausenberger Twelve, recently made at the testing laboratory at the Navy Yard, Washington, D. C.



## SHALL THE MOUNTAIN COME TO MAHOMET?

By SAMUEL S. PIERCE

**H**ISTORY often repeats itself,—than which there is no more striking example than the question of standardizing aeroplane controls.

Some ten years or so ago, European manufacturers of motor cars were far in advance of our own. At that time 90 per cent of the European constructors had hit upon a standardized control for automobiles which evolved from a "survival of the fittest" as being the most practical. In due time American manufacturers caught up with their brothers across the ditch in the quality of their vehicles, exceeded them in the quantity and in spite of a hitherto generous collection of control systems, adopted the European standard control which now exists on about 95 per cent of American motorcars.

Our aeroplane industry today bears much the same relation to the European industry as our automobile industry of ten years ago bore to the European automobile industry.

Today, the "Dep" control (or stick control which is the same in principle and reflexer) is standard all over Europe. The reasons for this are obvious.

Real cross-country flying began in Europe with the Circuit de l'Est in 1910—the true test of flying machines. In the thousands of long cross-country flights which followed, all kinds of controls were tried out, the inferior ones dropping out of existence through bitter experience in protracted flights. Within three years the "Dep" control was adopted by 50 per cent of the constructors; this fact alone is proof of its superiority. Today it is the standard control all over Europe.

That a standard control is necessary in this country, especially in case of war, is too obvious to require comment.

That the "Dep" control is standard in all countries except the United States, points to its own moral. All machines built in the United States for use by foreign powers in the present war are equipped with the "Dep" control.

Must history repeat itself over again? or have we sense enough to profit by the lessons of the motorcar industry?

Fortunately many of the leading aviators in this country have taken the matter into their own hands and will refuse to fly anything but the "Dep" control after January 1st, 1916.





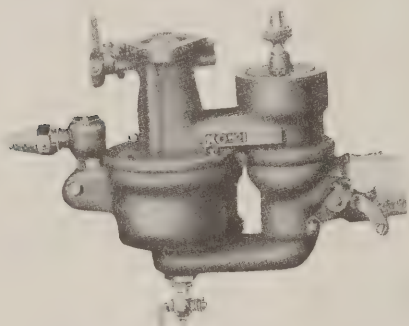
# ACCESSORIES



## The Stromberg Carburetor.

The fundamental requirement of carburetion is the correct proportioning of gasoline to air at all motor speeds under varying temperature and climatic conditions, regardless of quality of gasoline.

Under conditions of the present day, vaporization of gasoline is of even greater importance than proper mixture proportions. Very many of the troubles that are considered due to the mixture are in reality due to gasoline being in liquid form in the manifold, unequally distributed to the different cylinders, and flowing sluggishly along the walls without responding promptly to the throttle control.



These conditions may, to some extent, be overcome by a number of complicated mixture adjustments, but the need of such adjustments is entirely done away with if vaporization of fuel is effected.

In the type "K" and "KO" produced by the Stromberg Motor Devices Company, 65 East 25th street, Chicago, the fuel is very finely broken up under the high suction off the jet; it is discharged into the air current, not thrown on the walls, so forming a homogeneous stream of gaseous emulsion; and most important of all, the air is heated to a correct temperature.

This heat coming from the exhaust, is available more quickly after starting than if taken from water circulation and from its higher temperature is more effective.

## Rome-Turney Radiators.

The Rome-Turney Radiator Co., of Rome, N. Y., confines their efforts to the production of two types of radiators, the square tube honeycomb Mer-

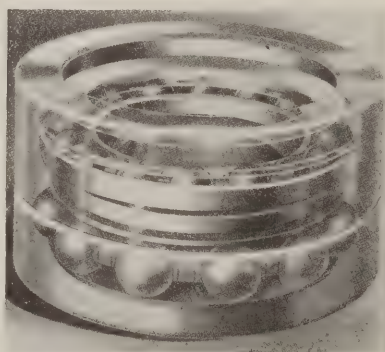


cedes type and the seamless Helical tube type. Rome-Turney Co. are the exclusive producers of this latter type in this country, which has developed great efficiency on the Curtiss and Burgess aeroplanes.

## "Norma" Combination Bearings

It is simply taking a conservative stand to state that no annular ball bearing should be subjected to a thrust load amounting to more than ten per cent. of its normal radial loading at a given speed, if efficiency and durability are to be considered. This amount of thrust load the "Norma" ball bearing will carry with safety—but in one direction only, because of its open type. Where a greater axial load than this must be accommodated, more hazard is taken, with consequent shorter life. It is better that a supplementary thrust bearing be employed.

But anyone who has had experience in the use of separate thrust and annular bearings, knows the difficulty (if not the actual impossibility) of securing and maintaining just the right adjustments throughout which will not cause cramping on the one hand, or looseness on the other. It may be stated almost as a rule of practise, that for best results in smooth and silent running, good efficiency and minimum wear cannot be secured with separate radial and thrust bearings, unless alignments are absolutely true and adjustments exactly correct.



The "Norma" combination annular and ball thrust bearing at once eliminates all these difficulties, because the necessary adjustments for the best efficiency have been made in the bearing itself. It is a self-contained, ready-adjusted unit needing only to be properly mounted—after which satisfactory service is assured.

In essentials, this "Norma" combination bearing consists of a standard "Norma" ball bearing and a standard "Norma" thrust bearing with housings, so combined in a unit structure that the correct internal relations of all parts are assured and maintained. In one direction it has a thrust capacity of approximately ten per cent. of the radial load. In the other direction it will carry a thrust load up to the limit of the thrust bearing rating. Like all "Norma" types, it is to be rigidly mounted. And in precision, materials and workmanship it is of the standard "Norma" quality.

## Magnalite Pistons.

The magnalite pistons produced by Walker M. Levett Co., Tenth avenue and 36th street, New York, have been used with remarkable success by many of the foremost racing cars in this country and abroad, and some of the aeronautical concerns are now becoming interested in

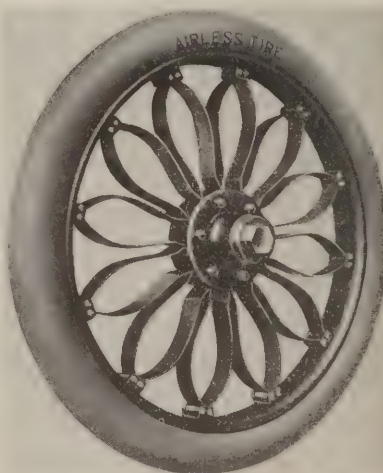
them. At the Sioux City automobile meet the first five cars, namely, Maxwell, three Duesenbergs and Maxwell, were equipped with the Levett equipment. Magnalite pistons have a thermal conductivity of 14 to 1 as compared with



iron castings and through lightening of the reciprocating parts greatly reduce vibrations. They have a tensile strength which is superior to the conventional type of pistons generally used. Magnalite pistons weigh approximately one-third as much as iron pistons and owing to their greater bulk—as relative to weight—and economy in machining, can be delivered in quantities at prices that are surprisingly little in excess of those paid for high-grade iron castings.

## The "Ideal" Wheel.

The Ideal Wheel Co., of Cincinnati, O., have succeeded in constructing an aero wheel which is laterally seven times stronger than wooden wheels of the same size. The construction of the wheel is



such that a pneumatic, airless, solid or steel tire may be used. Some of our prominent constructors have the matter of its adoption under advisement at the present time.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

### THE AERO SCIENCE CLUB OF AMERICA

29 West 39th Street New York City  
PACIFIC NORTHWEST MODEL AERO CLUB

915 Ravenna Boulevard, Seattle, Wash.

LONG ISLAND MODEL AERO CLUB

401 Grant Avenue, Cypress Hills, L. I.

### BAY RIDGE MODEL CLUB

6730 Ridge Boulevard, Bay Ridge, Brooklyn

### DETROIT AERO RESEARCH AND MODEL CLUB

c/o William P. Dean, 1717 Concord St., Detroit, Mich.

### BUFFALO MODEL AERO CLUB

c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.

### THE ILLINOIS MODEL AERO CLUB

Room 130, Auditorium Hotel, Chicago, Ill.

### TEXAS MODEL AERO CLUB

517 Navarro Street, San Antonio, Texas

### SPRINGFIELD MODEL AERO CLUB

Springfield, Mass.

MILWAUKEE MODEL AERO CLUB  
455 Murray Ave., Milwaukee, Wis.

### CONCORD MODEL AERO CLUB

c/o Edward P. Warner, Concord, Mass.

### PLATTSBURG MODEL AERO CLUB

c/o James Regan, Jr., Plattsburg Barracks., Plattsburg, N. Y.

MODEL AERO CLUB OF OXFORD  
Oxford, Pa.

## A Few Points for Beginners

To obtain good results with *any* model, two things (amongst others) are essential; the rubber must be of the best, and it must be *fresh*. On no account buy what is obviously old stock, no matter how cheaply it may be offered to you. The rubber to be any real use must be capable (when new) of being stretched to at any rate *seven times its own length without fracture*. The rubber must also be well lubricated. There are quite a number of good lubricants on the market; do not choose one which is too thick or looks at all dried up. Remember the rubber must be lubricated frequently. It should also always be removed from the machine after you have finished flying. It should on no account be passed round bare metal hooks; if this is the case buy some rubber tubing made especially for that purpose, cut it up into suitable lengths and place on the hooks *before* using the machine. On no account use a machine which is loose or flabby, or which, when shaken, "wobble-wobbles" all over the place; but a taut, well trimmed up machine, possessed at the same time of a certain give or flexibility which all aeronautical machines should possess. On no account try flying the machine in the house, or see (supposing the model one fitted with wheels) if it will "get off" the dining-room table. This advice may seem quite superfluous, and yet it is not so, for there has been quite a number of instances in which the above has been done, nearly always with disastrous results; not always to the model, be it noted—more often to something of much greater value. The smashing of windows could scarcely be considered as equated by the clearly demonstrated fact that the model would really fly. Generally speaking, of course, pictures are the worst sufferers. It is also most unwise to fly the model in a garden (large or small) in which there are numerous obstructions, such as trees, etc. Hundreds of models have been smashed up in this way.

Before actually trying to fly your model at all, there are

quite a number of things for you to learn, all of which *can* be learned either in the house or garden.

There is first of all the question of winding up, which reminds us that we have omitted the question of a "winder." As these can be purchased quite cheaply or easily adapted from an egg-beater or a drill, one should certainly be used. The hooks which are attached to the forward part of the rubber are attached to the hooks on the winder. The rubber should be twisted so that when the propellers revolve, the machine being held, stationary, a column of air is driven backwards behind the propeller, to the rear of the machine.

Having mastered the winding up, not forgetting to always keep the bearings well oiled, we pass on now to "gliding" or "launching" the machine in the open, with rubber motor and propeller *in position*, but the motor not wound up. The following applies equally well, whether the model be a hand-launched or r. o. g. (rise-off-the-ground) machine. Holding the model by both hands—the left hand grasping some fairly forward part of the *fuselage* or frame, and the right hand the central portion, bracket, bearing, etc., of the propeller, in such a manner as would prevent the propeller from rotating, supposing that the motor was wound up—point the nose or front of the machine *slightly* downwards and launch fairly fast into the air. Release the left hand just a moment *before* the right. If your model makes a nice even glide to earth, your elevation is probably correct; try several times to make sure. If the machine plunges nose first to the ground, you must increase the angle at which your elevator (small front plane) is set; do this little by little until you obtain good, even glides.

The number of winds obtainable, of course, depends on the number of strands of rubber used, and the pitch of the propellers. After a few trials, however, first by giving two or three hundred twists, you will soon be able to determine the necessary amount.

(To be Continued)



Model hydroaeroplane about to leave surface of water. Constructed by Mr. L. Bamberger, Bay Ridge Model Aero Club.



Mr. Waid Carl, of Concord Model Aero Club, launching his R. O. G. model during a contest.





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Part of the Treatment

Aviator (to pretty nurse): Will you be my wife when I recover?

Pretty Nurse: Certainly!

Aviator: Then you will love me?

Pretty Nurse: Oh, no; that's merely a part of the treatment. I must keep my patients cheerful; I promised this morning to run away with a married man who has lost both of his legs.

County Judge: How long have you owned a flying machine?

Aeroplanist (charged with speeding): One week, your Honor.

Judge: Um—then you can still afford to pay a fine. Twenty dollars!

#### Bright Side

"Will I recover, Doctor?" inquired the pedestrian who had been knocked down by an aeroplane.

"Surest thing you know!" replied the ambulance surgeon. "The fellow who owns the aeroplane is a millionaire."

A minister who lives in a small town is noted for his sententiousness, both in and out of the pulpit. As he was coming down the street one day, an aviator accosted him with, "Sir, can you tell me how to find the sheriff's office?"

"Yes, sir," was the instant reply. "Every time you earn five dollars, spend ten." And he walked on, leaving the astonished man gazing after him.

Fair Traveler on Aerobus—A stateroom to Seattle, please. Ticket Agent—Wash.?

Fair Traveler—Of course! Isn't there a lavatory on the boat?

He—Do you believe in preparedness?

She—Well, I wouldn't mind being in arms.—*Jester.*

#### The Aeroplane.

Once, when the gods on high Olympus tarried,  
Ere Troy was burned, or faithless Helen married,  
One Summer morn, the baby god, at play,  
Carved out a fragile boat, in curious way;  
But Neptune raged:—"That thing, you silly child,  
Is far too slight to dare my waters wild."

"Don't cry," soothed kind old Boreas; "Take these things  
And tack 'em on—this way—see! Just like wings!  
'Tis that same model makes the eagle fare  
Secure amid the deeps of upper air.  
Your ship shall fly! Kiss me—I'm off for Spain—  
There, child, you've built the first aeroplane!"

But devious Mars, aglow with hidden joy,  
Marked the huge portent in the aerial toy.  
So light it sailed the blue, so true it steered,  
So strong it held its way 'midst winds that veered,  
With gaze prophetic, riding those slight wings,  
Vaguely he glimpsed the destiny of kings.

So, when the play-worn baby's eyelids drooped,  
On hands and knees the subtle War God stooped  
And clutched the tiny treasure, lying near.  
In his dark caverns, toiled o'er year by year,  
The bird toy changed. That gift of Love, today  
Glooms o'er the world—War's ghastly Bird of Prey.

REBECCA LINLEY FRIPP, in N. Y. Times.

Southern Tailor (to aviator being measured for suit)—And the hip pockets, sir, what size shall I make them—pints or quarts?

#### Memorable.

"I shall never forget tonight," she said,  
As she looked at the twinkling stars;  
"Nor I," said he, as he took a puff  
At one of her dad's cigars.

Motor trouble and the only available landing place.—Country Life.





G. DOUGLAS WARDROP

Managing Editor

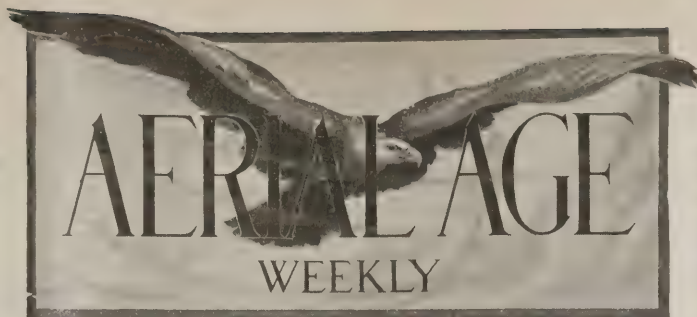
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No. 24

## General Scott Orders Investigation of Army Aviation Squadron

WHEN the court-martial proceedings against Lieut. Col. Goodier, several months ago, brought out charges and counter-charges between officers of the U. S. Aero Corps, AERIAL AGE, following its policy of concentrating on constructive work, decided to wait to publish the verdict in the case. The verdict was rendered sealed to the Secretary of War and is in the hands of the President.

A Washington despatch sent as we are going to press indicates that there are developments which it would be constructive to publish and we do so herewith. The following is from a despatch to the New York Times:

Washington, Feb. 18.—An extraordinary situation in the Aviation Corps of the Navy is revealed in excerpts from the correspondence between Lieut. Col. Samuel Reber, in charge of the Aviation Corps under Brig. Gen. George P. Scriven, Chief Signal Officer of the Army, and Captain Arthur S. Cowan of the Signal Corps at the aviation post at San Diego, Cal. Photographic copies of this correspondence, part of which has already figured in court-martial proceedings, were laid before the Senate Committee on Military Affairs to-day by Senator Joseph T. Robinson of Arkansas in support of his resolution calling for a sweeping investigation by a joint committee of the House and Senate into the aviation service.

Although the excerpts of correspondence afterward made public seem to involve only Colonel Reber, who is the son-in-law of Lieut. Gen. Nelson A. Miles, U. S. A., retired, and Captain Cowan, Senator Robinson told the committee that the aviation section of the Signal Corps was hopelessly inefficient, and that this fact was known by the officers in control and deliberately concealed by them from the War Department and from Congress. In the correspondence Colonel Reber appears to have been exerting his influence over Captain Cowan to prevent the facts from coming out, telling him in one letter that all he had to do is "sit tight and draw his pay."

Senator Robinson told the committee that Colonel Reber prompted Captain Cowan to practice "contemptible deceit." In one letter, quoted by Mr. Robinson, dated June 2, 1915, Colonel Reber asks Captain Cowan to get "drawings for the size of sheets to be placed under the seats of aviators for alleged armor protection." In this way, went on the letter, we can meet any charge that our machines are not armored.

"This resolution was introduced," Senator Robinson told the committee, "only after consideration of evidence that the aviation section of the Signal Corps is hopelessly inefficient and that this fact is known by the officers charged with its control, and deliberately concealed by them from the War Department and from Congress."

Under date of April 10, 1914, Senator Robinson said Captain Cowan wrote Colonel Reber:

"Frankly I don't want to put down in black and white over my signature my opinion about the way the Signal Service has handled this work. When I think of all the mistakes that have been made while I have had charge of this end of the work it just makes me sick. \* \* \* If I had known as much about this work six months ago as I know now I am convinced that I could have saved this whole unfortunate situ-

ation. \* \* \* I don't know very much about how this work should be done. \* \* \*

Senator Robinson introduced letters tending to show that while the purchase of motor trucks for the service was not authorized by Congress, it was planned to get them under an authorization for "accessories." Then he continued:

"As further disclosing the contemptible deceit which Colonel Reber prompted Captain Cowan to practice, I refer to his letter of March 23, 1915, just prior to the occasion when a large number of Congressmen, including myself, visited the aviation section near San Diego. He said:

"It is a good thing for the aviation section for you to put on your company manners and show off when members of Congress turn up. You can give them rides, get them interested as much as you can, but positively decline to give their wives, sweethearts or others joy rides in the air, stating that you did this once and the War Department howled for your head, which, although not a fact, will sound terrifying to the applicant."

"The captain pursued the above instructions to the letter. In a letter of Sept. 10, 1914, to Captain Clark, Captain Cowan wrote:

"It will be understood that you will not be required to fly in time of peace, although nothing need be said about this in the official communication."

"As conclusive evidence that Colonel Reber prompted Captain Cowan to make false reports concerning the true condition of the service, I quote from his letter of Feb. 25, 1915, as follows:

"He (the chief—General Scriven) will probably ask you for the personnel of the First Aero Squadron, and I suggest that you have prepared a list showing the officers, who shall I say theoretically, belong to the same. If you find it necessary to fill up by putting in the names of some of the aviation students put them in and give him a list."

"In a letter of May 19, 1915," Senator Robinson continued, "Colonel Reber cunningly suggests to Captain Cowan to make a false report, informing him that the answer which he had made previously to certain inquiries was not the correct one at all, and that he would find the answer in Colonel Reber's indorsement on a letter of General Murray, copy of which was inclosed. He also said:

"Sit tight and say nothing to nobody until the Inspector turns up, and then answer his questions along the line indicated in my indorsement."

Senator Robinson said that he had photographic copies of letters passing between Colonel Reber and Captain Cowan, showing favoritism to certain aviation officer and a purpose to demote others.

Senator Robinson reiterated his belief that the defectiveness of the aviation service could be established beyond doubt, and added:

"I believe it can be easily demonstrated that there is no sincere effort upon the part of Colonel Reber to improve the service; that aviation in the United States Army is contemptibly inefficient and its true condition deliberately withheld from those high in authority in the War Department, and that misrepresentations as to the progress being made by the aviators are deliberately and repeatedly made to the department. All of these circumstances, in my judgment, make imperative a Congressional investigation. If the committee

**America Must be Given a Navy Equal to the Best. If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.**



decides to make the investigation I will take the liberty of furnishing the evidence to establish further the statements now made."

After Senator Robinson had submitted his evidence several Senators said that the resolutions should be passed, and inquiries were made as to how long it would take a committee to go to San Diego to make an investigation.

Without waiting to determine what the United States Senate will do in the premises, Gen. Hugh Scott, Secretary of War *ad interim*, has ordered a thorough investigation into the charges made public through Senator Robinson. A special board will conduct the investigation for General Scott, and it is likely that Congress will make a separate investigation.

Concerning the investigation the *New York Sun* said editorially:

"An investigation of the Aviation Corps of the army, as proposed by Senator Robinson, of Arkansas, has become necessary; in fact, it would be a public scandal if the Senate were not to authorize the inquiry asked for. That aviation in the United States army is far below the military standard in Europe has long been known, and Congress must bear much of the blame for this condition. But it comes with something of a shock that the Signal Corps has failed to make good use of its material and apparently does not take aviation seriously. What other conclusion can there be from the letters of Lieutenant-Colonel Reber and Captain Cowan which Senator Robinson has brought to the attention of the Senate?

"The correspondence of these two army officers, who never expected that their letters would see the light, proves what Mr. Robinson charges, that 'aviation in the United States army is contemptibly inefficient,' and that condition in the Aviation Corps have been concealed from the War Department. 'Frankly,' writes Captain Cowan to his superior, 'I don't want to put down in black and white over my signature my opinion about the way the Signal Corps has handled this work.'

"The record reflects a failure to improve the service that had become habitual. Even granting that the Signal Corps was handicapped by limitations in organization imposed by Congress, it is not the way of the army to do poor work with its tools. We believe that a thorough inquiry will lead to the equipment of the service with an aviation department of which it can be proud.

"The fact that yesterday the acting Secretary of War, stirred to action by Senator Robinson's strictures upon army aviation, appointed a board of officers to investigate the aviation school at San Diego should not affect the purpose of the Senate. It will be for the good of the army and will promote the national defence to go to the bottom of conditions in the Aviation Corps and obtain information for corrective legislation by Congress."

#### Hydroaeroplanes Not Vessels

APPARENTLY assistant secretary of the treasury did not make himself familiar with a superior ruling of the Secretary of State, made in October, 1914, when he issued his order to all custom houses rating hydroaeroplanes as "vessels."

The Underwood tariff makes no provision for hydroaeroplanes as such, and so it happened that when compasses imported to be used on hydroaeroplanes of the United States Navy arrived at the Boston Custom House there was difficulty in classifying the articles for duty purposes.

The collector held that the compasses were properly dutiable at 25 per cent ad valorem under the tariff provision for "surveying instruments," whereas the importers who were importing the articles under a contract with the Navy Department asserted that as the hydroaeroplanes was a "vessel," the compasses were duty free as "all articles necessary for the outfit and equipment of naval vessels, or other vessels of the United States." The collector then asked for a ruling from Washington.

While the Treasury Department had no precedents to guide it in making a decision, so far as the tariff was concerned, Assistant Secretary Peters in replying to the Boston collector took occasion to issue the following general order:

The department is of the opinion that hydroaeroplanes constitute "vessels" within the meaning of that term as used in Sub-sections 5 and 6 of Paragraph J of Section 4 of the Tariff act of October 3, 1913, and that compasses for hydroaeroplanes constitute articles of outfit and equipment, and are entitled to free entry as such, subject to compliance with the regulations in T. D. 34,150. Aeroplanes, other than hydroaeroplanes, are not deemed to be "vessels" within the meaning of the said provisions of law.

While the Treasury's ruling has to do with imported hydroaeroplanes or their equipment, the question arose at the New York Custom House whether the fixing of the status of hydroaeroplanes as "vessels" might not have farther reaching consequence, since American manufacturers at the present time are shipping a large number of hydroaeroplanes to the British government for use in the war.

But the order from the Department of State, issued on October 14, 1914, covers this point broadly.

Here is the statement of the position of the American Government on these matters:

"The Department of State has received numerous inquiries from American merchants and other persons as to whether they should sell to Governments of nations at war contraband articles without violating the neutrality of the United States; and the department has also received complaints that sales of contraband were being made on the apparent supposition that they were unneutral acts which this Government should prevent.

"In view of the number of communications of this sort which have been received, it is evident that there is a widespread misapprehension among the people of this country to the obligations of the United States as a neutral nation in relation to trade in contraband and as to the powers of the Executive branch of the Government over persons who indulge in it. For this reason it seems advisable to make an explanatory statement on the subject for the information of the public.

"In the first place it should be understood that, generally speaking, a citizen of the United States can sell to a belligerent Government or its agent any article of commerce which he pleases. He is not prohibited from doing this by any rule of international law, by any treaty provision or by any statute of the United States. It makes no difference whether the articles sold are exclusively for war purposes, such as fire-arms, explosives, etc., or are foodstuffs, clothing, horses, etc., for the use of the army or navy of the belligerent.

"Furthermore, a neutral government is not compelled by international law, by treaty or by statute to prevent these sales to a belligerent. Such sales therefore by American citizens do not in the least affect the neutrality of the United States.

"It is true that such articles as those mentioned are considered contraband and are, outside the territorial jurisdiction of a neutral nation, subject to seizure by an enemy of the purchasing Government, but it is the enemy's duty to prevent the articles reaching their destination, not the duty of the nation whose citizens have sold them. If the enemy of the purchasing nation happens for the time to be unable to do this that is for him one of the misfortunes of war; the inability, however, imposes upon the neutral Government no obligation to prevent the sale.

"Neither the President nor any executive department of the Government possesses the legal authority to interfere in any way with trade between the people of this country and the territory of a belligerent. There is no act of Congress conferring such authority or prohibiting traffic of this sort with European nations, although in the case of neighboring American Republics, Congress has given the President power to proclaim an embargo on arms and ammunition when, in his judgment, it would tend to prevent civil strife.

"For the Government of the United States itself to sell to a belligerent nation would be an unneutral act, but the right of a private individual to sell to a belligerent any product of the United States is neither unlawful nor unneutral, nor within the power of the Executive to prevent or control.

"The foregoing remarks, however, do not apply to the outfitting or furnishing of vessels in American ports or of military expeditions on American soil in aid of a belligerent." These acts are prohibited by the neutrality laws of the United States."

#### Monster Rally for Aerial Defense Great Success

The national defense patriotic rally held in Carnegie Hall, February 23rd, under the joint auspices of the National Special Aid Society, and the Aero Club of America, was a great success, and a concrete demonstration of the tremendous popular interest in the subject of aerial preparedness.

Mr. Henry A. Wise-Wood, chairman of the Conference Committee on National Preparedness, and vice-president of the Aero Club of America, presided, and addresses were delivered by Mr. S. Stanwood Menken, president of the National Security League, Mrs. Lindon Bates, head of the Woman's Department of the Civic Federation, Mr. John Hays Hammond, Jr., inventor of the wireless controlled torpedo, and other revolutionary inventions, and the originator of the aero coast patrol, Mr. John J. Chapman, author and poet, and Mr. G. Douglas Wardrop, editor of *AERIAL AGE*, and member of the Aero Club of America.

Miss Anna Fitzu, of the Metropolitan Opera Company, rendered vocal selections in most charming fashion.

Great credit is due Mrs. A. W. Bartlett and Mrs. William Alexander, of the National Special Aid Society, for the excellent and efficient manner in which they took care of every detail of the arrangement of the meeting.



# THE NEWS OF THE WEEK

## Capt. Bristol Asks for \$20,000,000 for Naval Aeronautics

Advocating a \$20,000,000 aircraft fleet as a part of the five-year naval building program, Captain Mark Bristol, U. S. N., told the House Committee on Naval Affairs that the Navy Department had reduced by more than \$11,000,000 his estimates proposed for current appropriations for aeronautics.

Captain Bristol informed the committee that his original estimates called for \$13,600,000. The estimates submitted to Congress by Secretary Daniels call for an appropriation of only \$2,000,000 for aeronautics at this time.

Included in Captain Bristol's estimates were provisions for two aircraft ships—vessels designed for the transportation of aeroplanes, repair parts and machinery, in conjunction with the fleet. These ships were to cost \$3,000,000 each, but Captain Bristol said that, after a conference with Assistant Secretary Roosevelt, he was told that this item would have to be eliminated from the estimates.

Subsequently, according to the officer, his estimates were further reduced to the \$2,000,000 asked for in the estimates as finally submitted to Congress. Captain Bristol said he was not consulted about these further reductions.

The \$13,600,000 program, contemplated by Captain Bristol, who is the head of the Aviation Service of the Navy, would have completed by about two-thirds the \$20,000,000 building program supported by him.

The fleet now needed, he said, 82 aeroplanes, 5 dirigibles and 41 kite balloons. In addition to the fleet equipment, Captain Bristol estimated for 120 aeroplanes, 15 dirigibles and 15 kite balloons to be operated from fifteen naval shore stations under the patrol service.

Captain Bristol also made an estimate on the cost of forty-six aeroplanes for the use of the Naval Militia.

Captain Bristol said the five-year building program for the fleet should call for a total of 186 aeroplanes, 15 dirigibles and 53 kite balloons. The entire equipment needed, he said, would cost approximately \$20,000,000, and there would be 638 officers and 1,106 men in the aeronautical service of the Navy.

The fact that the estimates of Captain Bristol had been slashed by his departmental superiors was developed by Representative Britten, of Illinois. It was also developed that Captain Bristol had not been consulted about the proposed special flying corps in the Navy, which is recommended in the estimates submitted by Secretary Daniels. Captain Bristol said he did not advocate this special corps, as he believed all members of the Aviation Service should be fully trained in the Navy before assignment to the aviation branch and ought to be drawn from the line.

## Government To Send Four Aeroplanes to Manila

There will soon be shipped from the government aviation station at San Diego, Cal., four of the new army hydro-aeroplanes, which have recently been tested out there by Floyd Smith. These machines are the largest in the service and they can fly for about 500 miles without alighting for fuel. Three of the machines have established altitude and passenger carrying records. In Manila they will form a part of the equipment of the Second Aero Squadron.

## Vernon Castle Will Fly for England

Vernon Castle, the dancer, sailed last week on the Adriatic for England, where he will enter the army aviation corps and be officially known as Vernon Blythe, for Castle is but the stage name by which New York in general and Broadway in particular have known him since he came from England six years ago to make a living.

Castle gave up dancing and learned aviation for patriotic reasons alone. He is an Englishman. Most of his friends on the other side are in the army or the navy. The town in which his mother resides has been bombarded by Zeppelins. As long as his country needed men he felt that he was a "slacker" if he did not go to her aid, and he felt, too, that if he remained away in its time of trouble he would have forfeited the respect even of his mother. But because he was better fitted by his physique for Broadway dancing than he was for the sterner duties of a soldier he was troubled for a long time as to the best way to serve, until it occurred to him that he might become an aviator. Then his course was clear. He went to the Curtiss School of Aviation, settled his affairs, bade a sad farewell to the bright lights and sailed, declaring that if he survives he will come straight back to New York and Broadway.

## Anti-Aircraft Guns for the Fleet

Included in a request for an emergency appropriation of \$2,757,000 made upon Congress last week by William G. McAdoo, Secretary of the Treasury, in behalf of the Navy Department, there is provision for equipping the battleships with anti-aircraft guns.

The navy is now without guns of this type, though in Europe they are now recognized to be a very necessary part of a ship's equipment.

Recently, before the House Committee on Naval Affairs, Rear Admiral Joseph Strauss, Chief of the Bureau of Ordnance, made the reluctant admission that his estimates had been materially pruned by Secretary Daniels, who had not consulted the bureau about the pruning process. Among the items cut out, according to Rear Admiral Strauss, was one for equipping battleships and naval stations with anti-aircraft guns, such as are now being extensively used in the European war.

A letter from Secretary Daniels which accompanied the request was referred to the Committee on Appropriations.

"The amount requested under the Bureau of Ordnance," said Secretary Daniels in his letter, "is largely for the labor and material required to manufacture powder-transporting boxes, cartridge cases, and mines. Part of the sum will be needed to permit at an early date the furnishing of anti-aircraft guns to battleships in commission. The fleet is without guns of this type."



Glenn H. Curtiss, Jr., son of the head of the Curtiss Companies, ready for the day's work, outfitted in overalls that anticipate growth and expansion to parallel that of his eminent father.



### Massachusetts Starts an Aeroplane Fund

A fund of \$10,000 is to be raised in Massachusetts with which to purchase an aeroplane to be presented to the State Militia, and with the announcement of the movement came the information that \$1,300 had already been secured for this purpose. The movement is under the direction of Godfrey L. Cabot, president of the Aero Club of New England, and Lee Higginson & Co., of Boston, have consented to take charge of the fund. Checks to the order of Lee Higginson & Co., may be sent to Seth T. Gano, treasurer, 44 State street, Boston, Mass.

The movement is endorsed by General Leonard Wood, U. S. A., commanding the Department of the East; by Adjutant Charles H. Cole, of the Massachusetts State Militia, and by other military experts who realize the keen necessity for immediately getting aeroplanes and training aviators for military purposes.

"I am very much interested and pleased to learn that steps are being taken to provide an aeroplane of suitable type for the Massachusetts militia," says General Wood in a letter to President Cabot. "I feel very strongly that the provision of an aviation corps or force is one of the essential elements of preparedness and that in any case a large proportion of this force must be furnished by volunteers.

"I trust that the effort to provide a machine of suitable type for the Massachusetts militia will meet with immediate success and that it will be but the beginning of a much more extensive movement."

President Cabot in an address to the public says:

"Let the land of the Wright brothers, the first successful aviators, no longer neglect this essential branch of military defense. It is not proposed to join in the race for military supremacy in the air, but reasonable prudence requires that this nation should not be content with less than one-hundredth part as many fighting air machines as either France, England or Germany.

"Let those who desire peace and a continued independent existence for this nation zealously aid in this movement till the defense available in the air is many times what it is today, and leave opposition to those who desire that our country should become the vassal of some European power."

The first subscribers to the fund are as follows: Francis S. Eaton, \$100; William L. Putnam, \$100; X. Y. Z., \$500; George von L. Meyer, \$100; F. H. Prince, \$500.

### Denver Will Train Aviators

Through the enterprise of the Denver Aero Club, which has been organized with Charles E. Johnson, Foster Symes, Robert R. Hall, Claude K. Boettcher and Tyson S. Dynes, as incorporators, Denver, Col., will have an aviation training school in which men will be prepared to serve their country in the air squadrons.

The establishment of this school is part of a plan being worked out by the Aero Club of America for the training of

5,000 aviators who would be available for the service of the government in case of military necessity.

Upon his return to Denver from a trip East, in which he had conferred with the officers of the Aero Club of America and visited a number of aeroplane factories, Mr. Johnson immediately set about raising a fund and quickly secured \$3,000 for the establishment of the school of aviation. The plan calls for a fund of \$15,000 to provide a machine and maintenance and this sum will be raised within a very short time as the alert business men of Denver see both the necessity for trained aviators for the defense of the nation and the commercial advantage in having a training school located near the city.

### Flying Squadron Mustered in at Los Angeles

The First Aeronautic Section of the National Guard of California has been mustered in by Lieut. Commander A. H. Woodbine, head of the Los Angeles division of the naval militia.

Glenn Martin will present to the division a completely equipped biplane and announcement was made that Alan R. Hawley, president of the Aero Club of America, had notified the officers that a fund of \$1,950 would be available for additional equipment for the squadron. Plans are under way to raise additional funds which will be required by the squadron.

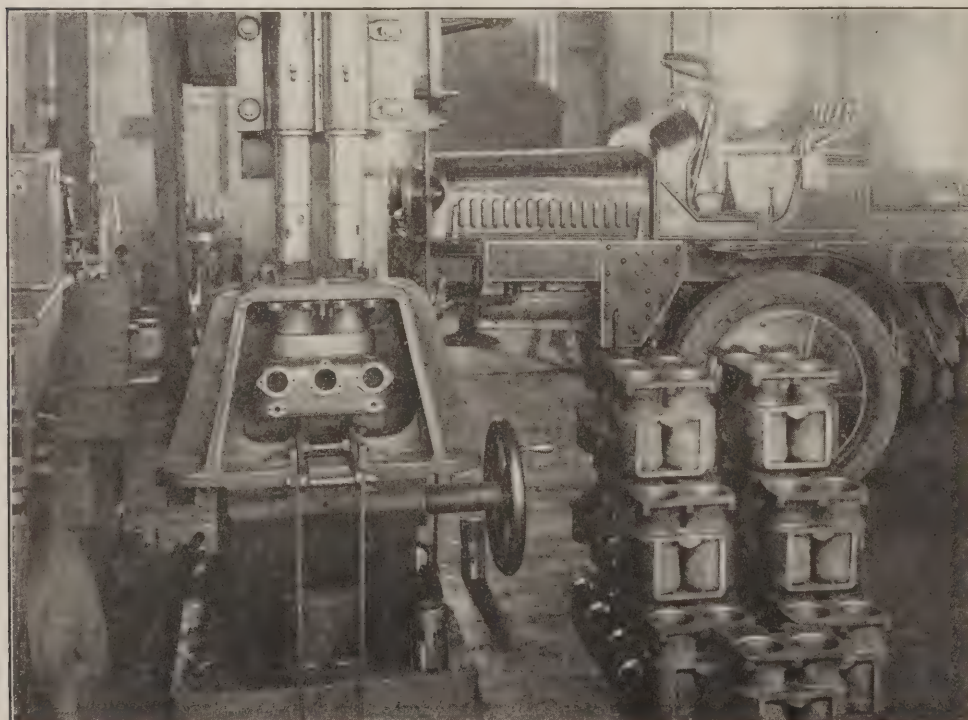
There will be thirty-two men in the squadron which will be in command of Ensign Simpson. It is expected that three licensed pilots as well as several employees of the Glenn Martin aeroplane factory will also enroll.

### French Close Streets To Enlarge Aeroplane Factories

The influence of the war in compelling motor car makers to enter the aeronautic industry, either as the result of patriotic promptings or in acceptance of commercial opportunities, is discussed by W. F. Bradley, a special representative of *The Automobile* with the Allied armies in France.

The automobile factories have been greatly interested of late in the production of aviation motors, and well-known firms are turning out engines; but not many firms have taken up the production of army aeroplanes. On account of the many improvements and many modifications in types, the automobile makers who have gone into this field have adopted the plan of selecting an accepted design and copying it faithfully in every detail.

"Obviously the aeroplane factories have increased the output enormously," says the writer. "In some cases streets have been closed to traffic and built over to provide additional shops, while other firms are obliged to leave their finished machines in open air, under a military guard, owing to inability to get enough buildings to house them while awaiting delivery. The automobile body shops are able to give considerable help in aeroplane construction, but up to the present have not been called upon to any great extent. While the automobile factories are working at full pressure, the body shops have nothing more important to do than produce ambulance bodies, field kitchens, etc."



This illustration shows the up-to-date methods employed by the Thomas Aeromotor Company, Ithaca, N. Y., in boring the cylinders for the Thomas 135 H.P. Aeromotor. Elaborate jigs provide for absolute interchangeability and rapid production.



### Wants To Fly from Home to His Office

Edward West Browning, a constructor of skyscrapers, is preparing plans by which he will be able to fly from the roof of his residence, the Orvis Apartment House, 35 West Eighty-first street, New York City, to the World's Tower Building at 110 West Fortieth street, which, by the way, he constructed. In anticipation of making daily trips to and from business by the crow line Mr. Browning has a ten year lease of the roof of his apartment house, a twenty story building, and the top of the thirty-story building on Fortieth street is also at his disposal.

"I intend," Mr. Browning is quoted as saying, "to fly to business and back every day. Anyway, every pleasant day. Why not? I can see no insuperable difficulties in the way."

"In the first place I have ample room for a safe starting point, and the trip from my home to the World Tower Building roof would be almost entirely over Central Park."

"The only thing in the way of an immediate beginning is that I shall wait till the weather becomes more pleasant and until I am more thoroughly trained in flying."

"My wife, who is as enthusiastic as I am over the project, and I, have been on several flights and have begun a course

of instruction at the aviation field at Hempstead, L. I., and anyway, to ward off all objections to granting me a permit to ride my latest modern hobby as high in the air as I want to, I'll engage an expert aviator for chauffeur, if that is demanded."

### Additions to the National Aeroplane Fund

The following additions to the National Aeroplane Fund have been received since February 4: Mr. Emerson McMillin, \$24,046.43; Philip F. DuPont, \$250; F. E. Richmond, 2d, \$100; Col. Max C. Fleischman, \$100; Mary D. E. Scofield, \$100; W. P. Bowman, \$100; Mrs. Cyrus Walker, \$50; Chas. Philip Beebe, \$50; Roland F. Knoedler, \$50; Wm. G. Mather, \$50; Carleton B. McCulloch, \$10; Lucy L. Lord, \$10; Chas. D. Murphy, \$10; Mrs. Mary Hill Langenberg, \$10; Chas. D. Orth, \$10; Morrison Harris, \$5; Spirit of '76 Chapter, D. A. R., \$5; Mrs. J. P. Nelson, \$5; Stedmans Hanks, \$5; Alfred N. Martin, \$5.

Contributions to the fund may be made by addressing The National Aeroplane Fund, 297 Madison avenue, New York City.

## IMPROVED STURTEVANT 140 H. P. EIGHT CYLINDER AERONAUTICAL MOTOR

A representative of AERIAL AGE recently held an interesting interview with Mr. H. E. Morton, Chief Engineer of Gas Engine Design of the B. F. Sturtevant Co., Hyde Park, Mass., in reference to their improved 140 H. P. aeronautical motor. Mr. Morton said, in part:

"One of the most important features of our improved motor consists of a new type of valve timer. This valve timer, which is in the shape of a cam, not only insures a smooth, quiet running motor, free from vibration, but at the same time produces a marked increase in the horsepower output of the engine at normal speeds. Furthermore, this valve timer eliminates all of the severe shocks incident to the ordinary type of cam, thereby reducing valve spring crystalization and breakage to a minimum."

"We are now prepared to provide these motors with two eight cylinder magnetos, each constituting an independent ignition system, the cylinders being equipped with two spark plugs apiece. We found until recently that there were no eight cylinder magnetos available for use on a high speed motor that would operate for any considerable length of time without breaking down in some manner or other. As the result of co-operation, however, between our engineers and those of a prominent manufacturing company, an eight cylinder magneto has been developed which has proven after a long series of tests to be thorough reliable and efficient."

"Provision has been made to permit of the application of the Christensen air starter to the motor. This starter is extremely light, very reliable and efficient, being particularly adapted for use in connection with aeroplane work."

"The main bearings which support the crankshaft have been fitted with a special type of babbitt lined bronze bushings of great rigidity and durability. The construction of these bushings has been worked out in accordance with our years of experience in high speed bearing problems."

"In addition to our standard designs we are prepared to supply a gravity feed carburetor located beneath the engine bed and connected to the cylinders by means of a special water jacketed manifold."

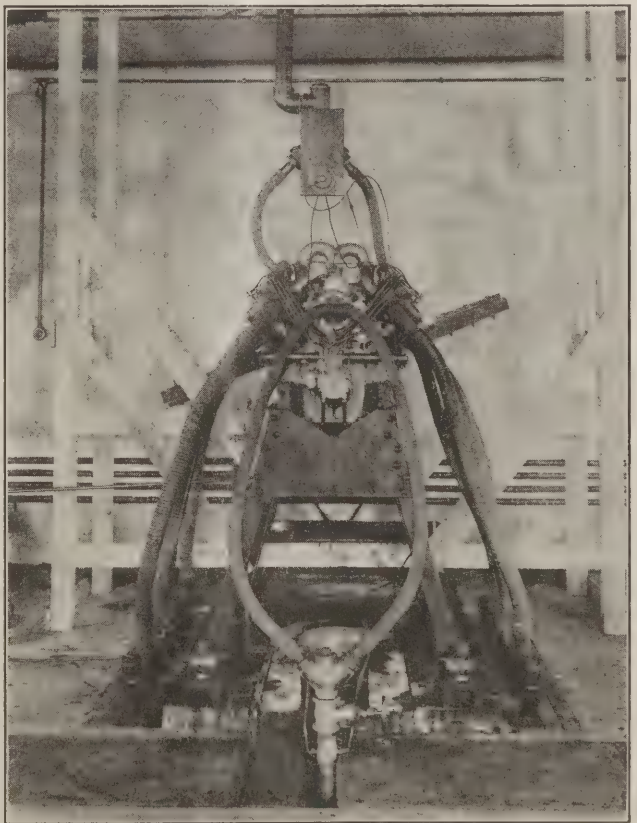
"We can provide at the option of the purchaser a special air pump for use in connection with a pressure feed gasoline system. This pump is located on the timing gear case cover, being operated by means of an eccentric on the camshaft."

"These motors are being provided with right or left hand rotation to meet the demands for two-engine plants."

"In addition to the regular reduction gear drive the motors are also offered with a direct crankshaft drive which is particularly adaptable for use in dirigibles, etc. The direct drive can readily be changed over to the reduction gear drive. This allows the motor to speed up over 2000 R.P.M. with a proportional increase in power."

"The improvements which have been mentioned are only a few of the more important ones that have been incorporated in the design and construction of the motor. These changes

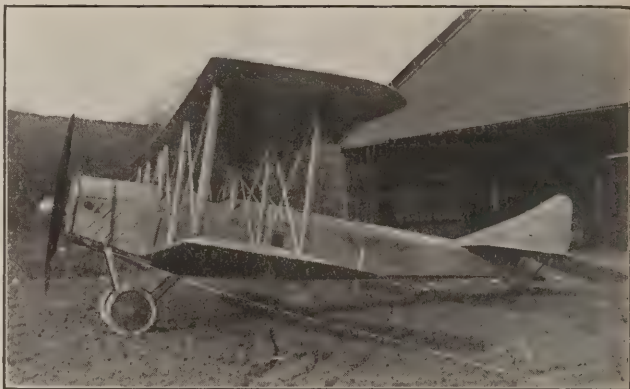
have not been made as the result of sudden inspiration, but have been developed gradually after months of exhaustive research work, both in the laboratory and on the test plate, during which time every vital part of the engine was tested to destruction. These tests, which are most severe and exacting in their nature, have proven the wonderful value of proper heat treatments and of the use of high grade alloy steels. We are constantly experimenting with new heat treatments, but up to the present time we have been unable to better the heat treatment of a single part of the motor."



An improved Sturtevant 140 H.P., 8-cylinder aeronautical motor mounted upon a moulinet or fan dynamometer testing stand. During an actual brake horsepower test short aluminum exhaust pipes such as are regularly supplied with the motor are substituted for the long, flexible ones illustrated.



## THE THOMAS D-2 MILITARY TRACTOR BIPLANE



The Thomas D-2 military tractor has been produced to supply the demand for the most modern military aeroplanes of the rapid reconnaissance type. It is a powerful, speedy and sturdy two-passenger machine, and has a speed range of 40 to 102 miles per hour. The 135 h.p. motor will fly it at this speed, carrying fuel for four hours' flight, two passengers, and an additional useful load of 250 pounds, making a total useful load of 1,082 pounds.

*Dimensions*—Over-all length, 25.5 feet; span, 37 feet; chord, 5 feet 3 inches; gap, 5 feet. Total lifting area, 401.4 square feet. Loading, 5.6 pounds per square foot.

*Wings*—The special wing curve is one of the contributors to the success of the machine. It was designed from Eiffel's data and is very efficient, having the high lift to drift ratio of 1 in 20, which gives fast climbing ability and good speed range.

The wings are built up in five sections. Practically the entire lifting surface is comprised in the four main sections, while the small section fits over the fuselage. All the wood used is clear silver spruce, and the most skilled workmanship is employed to obtain the lightest sections possible with the required strength. All ribs are built to secure perfect alignment and are proof against warping or weakening from exposure or bad weather. The fabric used is high grade Irish Linen of very high strength; it is sewn into place, treated with six coats of Emaillite and three of varnish, giving great tightness, strength and durability.

*Fuselage*—The body is of the original Thomas streamline form, having minimum head resistance and giving a very smart appearance. All exposed members or fittings are carefully fitted with streamlining members. The construction is largely of white ash; all longitudinal members are of solid section, tapered for lightness; all clips are of steel and so designed that they do not pierce the longitudinal members. The very comfortable wicker bucket seats are fitted with three-inch curled hair cushions of heavy green corduroy.

*Landing Gear*—This is composed of a pair of V's formed by four stout streamlined struts; two covered wheels, 26-inch x 4-inch, with Goodyear tires; a hinged, tubular steel axle with rubber shock absorbers; and a streamlined channel member enclosing the axle.

This arrangement offers the absolute minimum of head resistance and is the very safest and strongest gear for landing on and rising from rough ground.

*Wires*—Roebling wires of ample strength are used; the most important being stranded steel cable, doubled for safety,

while nickel plated wire is used for minor bracing and the fuselage. For very quick assembly and accessibility this design is noteworthy.

*Fittings*—All fittings are specially made and inspected, and all are of latest design and best quality. All bolts, clips, etc., are of the best tensile steel obtainable.

*Finish*—All interior parts are waterproofed; all exterior parts are filled and coated with high grade spar varnish. All metal fittings are given a coat of metal primer and two coats of color varnish.

*Power Plant*—The machine has been designed to use the 135 h.p. Thomas aeromotor, Model 8. This is a high speed, geared down, eight-cylinder motor of the most modern design, and of excellent workmanship. It cannot be improved upon for reliability and endurance. Its gasoline consumption is 14 gallons per hour and oil 1 gallon.

A 12-gallon service gasoline tank is mounted in front of the center wing section and is supplied by an engine-driven circulator pump from the main 54-gallon tank behind the passenger's seat.

The Paragon propeller, especially designed for this outfit, is used. It has, in common with the rest of the machine throughout, a factor of safety of six.

*Control*—The control is the universally used Deperdussin control, in which the elevator is operated by pull and push on the wheel, which is on a strong pivoted post; the rudder is operated by a strongly built, comfortably placed foot bar; the four ailerons are hinged to the outer extremities of the rear wing spars and are operated by turning the wheel. The control members are especially strong, all joints carefully wrapped and brazed, and all are placed so as to be easily inspected. All the surfaces are very large, insuring great ease of control.

*Weight*—The total weight of the machine, fully loaded, is 2,500 pounds.

*Equipment*—The instrument board on the dash has as standard equipment a 7,000-foot barograph for showing the altitude, a revolution counter (Tel or Warner manufacture), a Pitot tube for the air speed, an inclinometer showing angle of flight, a reliable clock, a switch and magneto advance, a gasoline pressure gauge and gasoline shut-off, and an emergency hand pump for the gasoline system and a Sperry air compass.

A complete set of tools for the motor is supplied and also a large, substantial tool chest and spare parts box.

Very strong shipping crates are supplied with each machine.



The Thomas D-2 Military Tractor, with Frank H. Burnside, pilot, which made a speed of 103 miles per hour the other day.





# FOREIGN NEWS

By JAMES E. CLARK



## AUSTRIA

Eleven Austrian aeroplanes threw bombs on Milan recently, killing six persons. About the same time Schio, Italy, was also attacked by airmen.

## BULGARIA

Strumnitza, a Bulgarian frontier fortress and garrison town, about 60 miles north of Salonica, was raided by a squadron of thirteen French aeroplanes a few days ago. A total of 158 bombs were dropped on the town and the military encampments and the aviators saw a number of fires break out as the result of their fusillade. The machines were fired upon constantly, and by many guns, but the entire squadron returned without damage.

## FRANCE

Dr. Charles A. Pryor, of Williamsport, Pa., attached to the American Ambulance Corps in Paris, upon his arrival in this country on a furlough, told of a new ruse tried by the Germans in the last Zeppelin raid on Paris. At the first alarm he saw in the sky what appeared to be a great fleet of Zeppelins with powerful searchlights. Then the anti-aircraft guns opened fire on them and the lights in the sky were extinguished one by one. But the searchers failed to find any wreckage of the dirigibles and later it was established that the Germans had drawn the fire of the French by using decoy balloons. The decoys had apparently been constructed in the form of bombs, which, when dropped from the airships, exploded and floated in midair. Against these the fire of the French guns had been directed, while the Zeppelin and the Fokkers which participated in the raid took care to avoid the zone of fire.

There is a group of patriots in Paris who contend that spies located in that city aid in the raids by signalling the Zeppelins through a code of lights. One of the critics even tells how it is done. Warned of an impending raid, the German spies make illuminated signals from three points, forming a triangle, in the center of which the raiders are desired to plant their bombs. To test out the accuracy of the theory three pails of water, with lights reflecting from them, were placed on roofs and aviators were able to pick them out from a considerable height. To offset this system it is proposed that aviators be detailed for the inspection of roofs and that the plan be destroyed by the multiplication of similar signals in open places outside of the city.

It has been proposed that the Zeppelin signals be abandoned in Paris, as they lead people into danger instead of giving protection. On the occasion of the last raid practically everybody rushed to a window as soon as the fire alarms were sounded, the cafes were emptied and the streets were so thronged that in some instances it was necessary for the police to close thoroughfares to prevent the gathering of great crowds where the peril was greatest. As long as the people rush to open places, thus unnecessarily exposing themselves, instead of seeking refuge in a cellar, why, it is argued, should the authorities add to the danger by calling the people out?

## GREECE.

Assurances have been given to the Greek government by the French and British ministers that the allies will pay indemnities to all merchants and private individuals who suffered damage from the recent Zeppelin raid on Salonica. Payments are to be made after the Balkan campaign is ended.

## GREAT BRITAIN

Four German seaplanes dropped bombs on English towns on Sunday morning, February 21, killing a little newsboy—who was walking along a road with a bundle of papers under his arms—two men, and injuring a marine. The raiders traveled in pairs. The first two appeared over Lowestoft, 30,000 population, in Suffolk, at 10:55 A. M., circled over the town for five minutes as if seeking a mark, and dropped bombs. Then they ascended to a great height and vanished. A few minutes later they again appeared for a brief period, after which they disappeared to the westward. Seventeen bombs were dropped, but no lives were lost and little damage was done to buildings at this point.

Two other German seaplanes meanwhile were making for the Kentish Coast. The first passed over the Kentish knock lighthouse and dropped bombs. The last raider flew for the town of Walmer, which has a population of 5,000, and from a height of less than 2,500 feet it dropped six bombs. Two of the missiles destroyed roofs and broke windows. One bomb dropped near a church where services were being held and the congregation was singing. Though there was a tremendous explosion which shattered the windows the interruption was only momentary and the service was continued. A third bomb fell on a roadway along the beach, killing the boy and injuring a marine.

This raid has revived interest in a statement recently made in a German newspaper to the effect that arrangements had been perfected whereby a submarine could be used as a base, or hangar for a small seaplane. Thus, after conveying the aeroplane to a suitable distance the aircraft could rise and quickly strike. Then returning to its submersible base both crews and the plane could take refuge beneath the surface of the sea to avoid detection.

"It is useless," declared Lord Kitchener, Secretary of State for War, to the House of Commons, "to discuss the moral iniquity of air raids. We have to take every possible step to defend the country and to inflict punishment on the invaders. Up to date the air raids of the enemy have been of no military effect. On several occasions enemy air craft were disabled. At the same time it is impossible to guarantee that there will be no repetition of the raids.

"The construction of anti-aircraft guns now has priority over other ordnance. It is difficult to hit Zeppelins with guns, therefore the aeroplane defence is an important part of the scheme."

Harold J. Tennant, Under Secretary for War, said in reply to a question that Fokker, the Dutch inventor of the fast aeroplane now in use by the Germans, had offered an aeroplane of his invention to the British War Office in 1913. This machine, Mr. Tennant said, was inefficient and dangerous and was not adopted. The later Fok-

ker designs of greater horsepower, such as have been adopted by Germany, were not offered to Great Britain.

The Bishops of the Church of England, in convocation at Canterbury Cathedral, adopted a resolution declaring against reprisals by air raids "which have as a deliberate object the killing or wounding of non-combatants."

The Archbishop of Canterbury in moving the church resolution said the Bishops desired to encourage all possible energy in the prosecution of the war, but that there was danger of drifting into ways which would have unhesitatingly been condemned as dishonorable a few years ago.

The Bishop of Bangor alone opposed the resolution. "In a war like this," said the Bishop, "we cannot separate combatants from non-combatants. The strengthening of the blockade against Germany involves the making of the war on women and children.

"If we could send 100 aeroplanes to drop bombs on the rich business part of Frankfurt the effect produced would be felt from end to end in Germany, and the sending of Zeppelins to this country would be denounced as a blunder, as inexcusable, as a crime. If a son of mine were asked to join in a punitive exhibition on a German town I would advise him to go and do his duty."

## GERMANY

From the Swiss side of Lake Constance it is apparent that wonderful strides have been made in the construction of Zeppelins by the Germans. The manoeuvres are watched with keen interest by many observers. The tests now being made are no longer distance trails, according to the observers, but are in the nature of war movements, and they are carried on by night, as well as during the day. The big L.-Z.-95, a brief description of which has heretofore appeared in Aerial Age, has been greatly altered from the previous models and most noticeable of the changes is that the car hangs lower than in the older types. For about one-fifth of the whole length of the new model there is, extending back from the point, a metallic gleam, which the observers in neutral territory account for by saying that the Germans have probably acquired the Schoop metal spraying process and that they have used it to reinforce the front part of the envelope. The practice firing with the machine guns is seen and heard during the day. Experiments are also being made with smoking gases, which suddenly envelop the airship in a great dense cloud, intended to aid in escaping from the enemy's fire. During night manoeuvres the invisible Zeppelin flashes searchlights and drops flare bombs, which light up the surface of the lake for several minutes, long enough to find the mark sought for.

By the way of Scandinavia comes a statement to the effect that the Kaiser now shares the views of his diplomats, who disapprove of the air raids on England. It is said to be his opinion that they are senseless, being of no military importance and only calculated to make friendly relations with Great Britain more difficult after the war.

## HOLLAND

The report that a Zeppelin had been blown adrift during a storm and wrecked at Blerik, in Holland, and there seized and interned by the authorities is without foundation.

## ITALY

It is announced that the Pope will make a vigorous protest to Austria against the bombardment of holy places in Italy. After the destruction of a famous ceiling in a Venetian church the Pope urgently requested Emperor Francis Joseph to spare Italian churches. Assurances were received that the churches would be spared, but it is now realized that the hope of relief from the danger was futile, because from a height of over a mile the aviators can hardly distinguish between a church and another building. Cardinal Ferrari wrote to Rome a description of the raid on Milan and asked the Pope to take such action as the case deserved. The Cardinal declared that far from terrifying the people, these incursions only strengthened their hatred of the Austrians, and that as a result Milan's ardor for the war was greater than ever. Similar indignant reports have been received from several other prelates. After the Pope had read these letters he shut himself up for two days. It is believed he is drawing up a very strong protest to be sent to the Imperial Government of Vienna.

Full corroboration of the theory that air raids on non-combatants aid the enemy by calling out new determination, new resources and a greater military spirit in the people who are thus attacked is found in Northeastern Italy, where unfortified places have been bombarded and sacred buildings damaged. The indignation of the population has taken a practical form.

Subscriptions to the third war loan have suddenly been resumed with greater vigor, and it is predicted that by the end of this month the subscriptions will surpass 3,000,000,000 lire. Youths in the provinces along the coast of the Adriatic have asked permission to form special bodies to attack the enemy. Funds are being raised to construct new aeroplanes to chase the enemy's airships, while throughout Lombardy new factories are being started to produce arms and ammunition. Everybody feels that Austria's action must be advantageous to Italy and injurious to herself.

## TURKEY

On the Irak front a Turkish aeroplane flew over the artillery positions of the enemy at Kut-el-Amara and dropped twelve bombs, which, as the war department bulletin expresses it, "had great effect."

## RUSSIA

There are frequent aeroplane raids above the sectors of Riga and Dvinsk, bombs having been dropped in many places in both regions. South of Dalen Island bombs have been dropped by Russian airmen. In Galacia Russian airmen threw bombs, on February 16, on the town of Buczac.







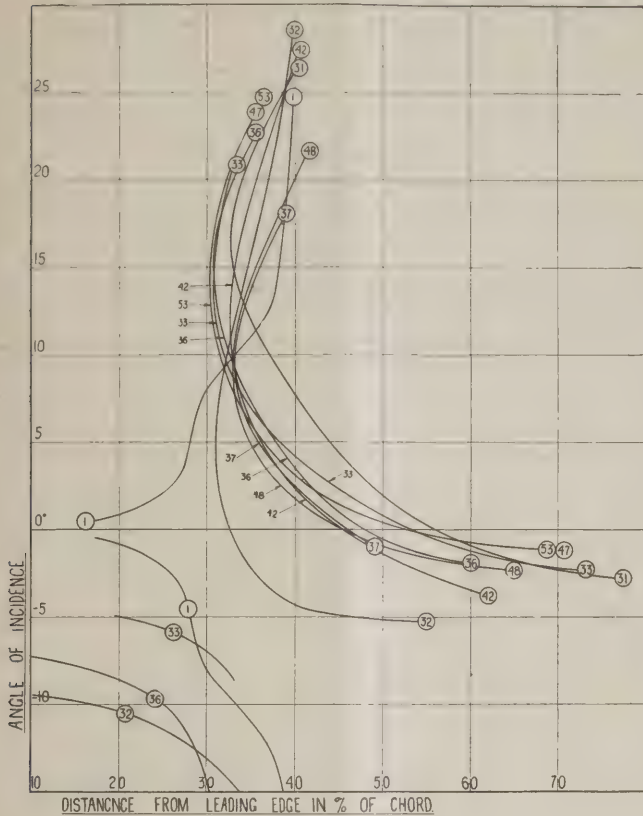


Fig. 4

Because of the loss of lift at certain angles, two modifications of the usual biplane construction have been resorted to as a remedy: giving the lower plane, 1, a greater angle of incidence; and 2, a smaller area than the upper. The first increases the drag, particularly at the limits of the speed range, with a corresponding increase of power required to maintain the same speed range. Hence, such construction is not advisable except possibly in such instances as flying boats, where the speed range is usually not large and considerable lift is required from a limited wing surface. The second modification results in decreasing the area of lower efficiency, hence the efficiency of both wings taken together is increased. This is shown in the following formula:

$$\left( \frac{\text{Average Interference Ratio}}{2} \right) = \frac{(\text{Area of upper wing}) + \left( \frac{\text{Area of lower wing}}{\times \text{its interference ratio}} \right)}{2} \dots (2)$$

The term "interference ratio" is used for the ratio of the lift of a biplane wing to that of the corresponding monoplane wing. Sometimes the question arises as to whether the area of wing flaps, when they are used, should be considered as a part of the wing area or not. This will depend, of course, upon whether the flaps are so adjusted as to produce a lift, or to be neutral.

#### Advantages of Multi-Planes

The eliminating processes of the present war have made the monoplane almost extinct for two important reasons, since the speed range need not be sacrificed. These reasons are the greater inherent structural advantages provided by the girder-like construction of a biplane; and the compactness resulting from the smaller spread required for a given area of wings—a matter of importance in landing in restricted places, and in storage and shipment. Both of these reasons must be considered when the spread of the lower wing is made less than the upper, though the advantage of a short lower wing when listing to one side while making a landing should not be overlooked.

The same advantages of the biplane over the monoplane are accentuated in triplanes, though the reduced climbing speed is accentuated also. The advantages of a narrow wing spread as aeroplanes are gradually brought into commercial fields will probably cause the triplane to be looked upon as a common construction at some time in the future. Its speed range will be but little if any different from that of a corresponding monoplane, and what difference there is will not be at the point of maximum speed. The lower and middle wings will have the same lift coefficients as the lower wing of a biplane, and for convenience in calculations it may be assumed that a triplane is a biplane with a lower wing of the same area as the two lower wings of the former.

#### Stagger

Staggering the upper wing forward results in a slight increase of lift, the gain increasing with the stagger and the angle of incidence until it reaches about 10 per cent. near 20 degrees, when the stagger is equal to the chord. This implies that staggering will have a negligible effect on the maximum speed of an aeroplane, but it will aid its climbing ability somewhat. Also, it is often found of considerable aid in increasing the field of vision for the pilot or observer, or possibly both, which is ample justification for its popularity since it has no drawbacks.

#### Power

The most convenient way to show the speed range and climbing rate of an aeroplane is by means of a curve between speed and horsepower. Such a curve is the sum of two other curves, one for the wings alone, and the other for "structural resistance"; that is, the power expended in moving the body, struts, wires, landing gear, etc., against the air. As an example of the method of computing the power-speed curve for the wings alone the aeroplane wings previously calculated for a 2,000-pound monoplane at thirty-three miles per hour will be considered. It was shown that if wing No. 33 were used its area would have to be 552 square feet. The ratio of lift-to drag for this wing is seen from Fig. 2 to be 6.7. Hence

the drag will be  $\frac{2000}{6.7} = 298$  pounds. The horsepower required is given by the formula:

$$\text{H.P.} = \frac{(\text{Drag in lbs.}) \times (\text{Speed in miles per hr.})}{375} \dots (3)$$

$$= \frac{298 \times 33}{375} = 26.2$$

At 40 m.p.h., since the total weight is the same, the lift coefficient will be given by the following equation, rearranged from equation 1.

$$(\text{Lift coefficient}) = \frac{(\text{Total weight})}{(\text{Area, sq. ft.}) \times (\text{Speed})^2} \dots (4)$$

$$= \frac{2,000}{542 \times 40 \times 40} = 0.00231$$

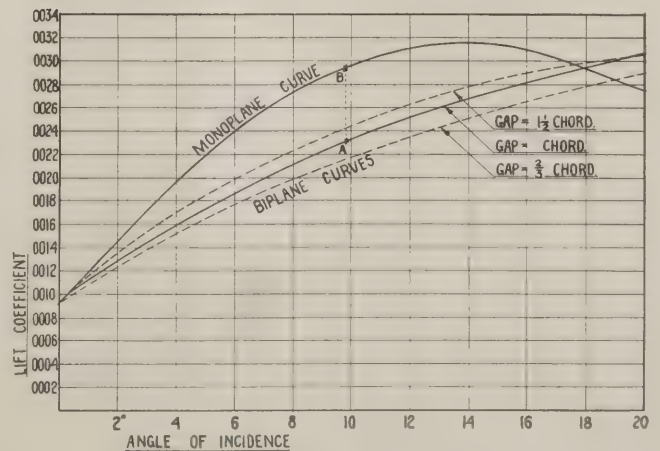


Fig. 5  
(To be concluded)



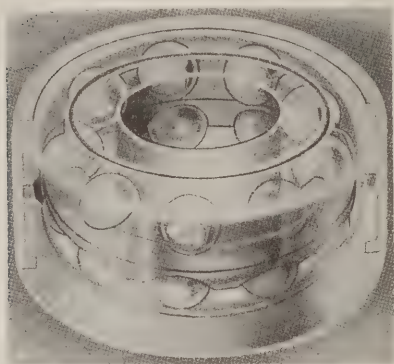


# ACCESSORIES



## New Departure Ball Bearings.

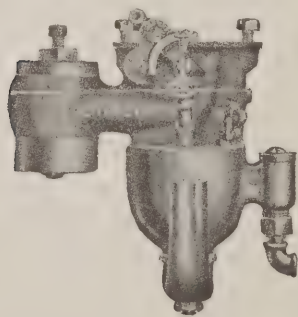
The New Departure double row bearing is a distinctive and patented design developed by the New Departure Ball Bearing Company, of Bristol, Conn. The bearing has two rows of balls and two sets of ball raceways. The raceways are mounted in such relation that loads from any direction are successfully sustained. This distinctive feature is obtained by



designing the bearing so that the imaginary load lines passing through the balls are at an oblique angle with the vertical centre line of the bearing, whatever may be the direction from which load stresses are imposed. The bearing will take radial loads from one-third to one-half greater than the maximum capacity of a single row bearing of the same bore and diameter and will at the same time resist considerable thrust.

## The Schebler Carburetor for Aero Engines.

The model "L" carburetor, designed by the Wheeler & Schebler Co., of Indianapolis, is especially suitable for the exacting needs of high-speed motors, where low throttling, rapid acceleration, maximum power and speed are required. It is a lift needle type carburetor and is



so designed that the amount of fuel entering the motor is automatically controlled by means of a raised needle working automatically with the throttle. The supply of gasoline in this instrument can be adjusted for low, intermediate and high speed, each adjustment being independent and not affecting either of the others.

The model "L" is furnished with a

jacket around the throttle, which can be connected with the hot water when a circulating pump is used; also a bend for taking warm air from around the exhaust manifold into the initial air opening of the carburetor by means of the hot air drum and tubing.

For certain classes of marine and heavy duty work a dash pot type air valve is furnished in place of the regular type.

To make installation of this carburetor on certain motors it is sometimes necessary to have special arrangements of the air valve and throttle motion. The air valve to the right of the cam is right-hand body and to the left of the cam is left-hand body. The throttle closing to the right is right-hand motion and closing to the left is left-hand motion. These observations to be made with the cam adjustment toward you.

The Model "L" is not affected by altitude changes and the carburetor can be adjusted to take care of any slight differences in the motor without any changes in equipment.

## The Rajah Plug.

The new Rajah plug is now standard equipment on the Curtiss, Sturtevant, Burgess, Thomas and Duesenberg aeronautical motors. It is the same as the regular Rajah plug with the addition of



the high heat resisting "condensite" protecting part screwed to the plug bushing and the special nipple covering the clip terminal on the cable. It is furnished in all standard sizes with a Rajah regular terminal fitting any scale.

## Western Electric Aero-Phone

A telephone equipment especially designed for communicating between the



pilot or aviator and the observer or other occupant of an aeroplane, and

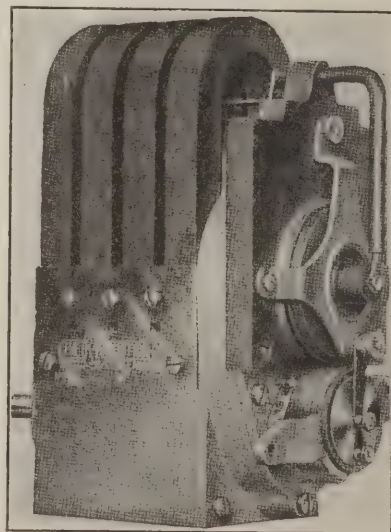
which makes conversation easy in spite of the high velocity of the wind and the noise from the engine.

The apparatus consists of a transmitter for each person, which is worn underneath the clothing, strapped to the chest, and a double headband receiver worn over the ears underneath the cap or other head covering. These two pieces of apparatus are connected by means of suitable cords and are brought out and terminated in a short length of cord, to the end of which is attached a small plug which is inserted as the user takes his seat in a jack mounted on the framework of the machine. One of these jacks is provided for each occupant.

The battery required consists of three standard dry cells, which will provide continuous service for 100 hours, if necessary, without weakening sufficiently to make conversation difficult.

## The K-W Ignition Apparatus

A High-Tension Magneto is a complete ignition system all in itself, requiring no spark coil, no timer and no batteries. It is geared or timed to the motor, and can be used on any make of motor that has a provision for a magneto; or on motors that have no pro-



vision for a magneto, it can be driven by gears or sprocket and chain.

The speed is exactly crankshaft speed, for all one, two and four-cylinder motors, and one and one-half crankshaft speed for three and six-cylinder motors. The K-W High-Tension Magneto is the result of long experience in this line. The first K-W High-Tension Magneto was made a little over four and one-half years ago; since then constant experiment and relentless and exhaustive tests have combined to develop a High-Tension Magneto the equal of which the world has never yet seen. Either system is positively guaranteed to start the engine without batteries, and to run it perfectly at all speeds.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
9730 Ridge Boulevard, Bay Ridge, Brooklyn

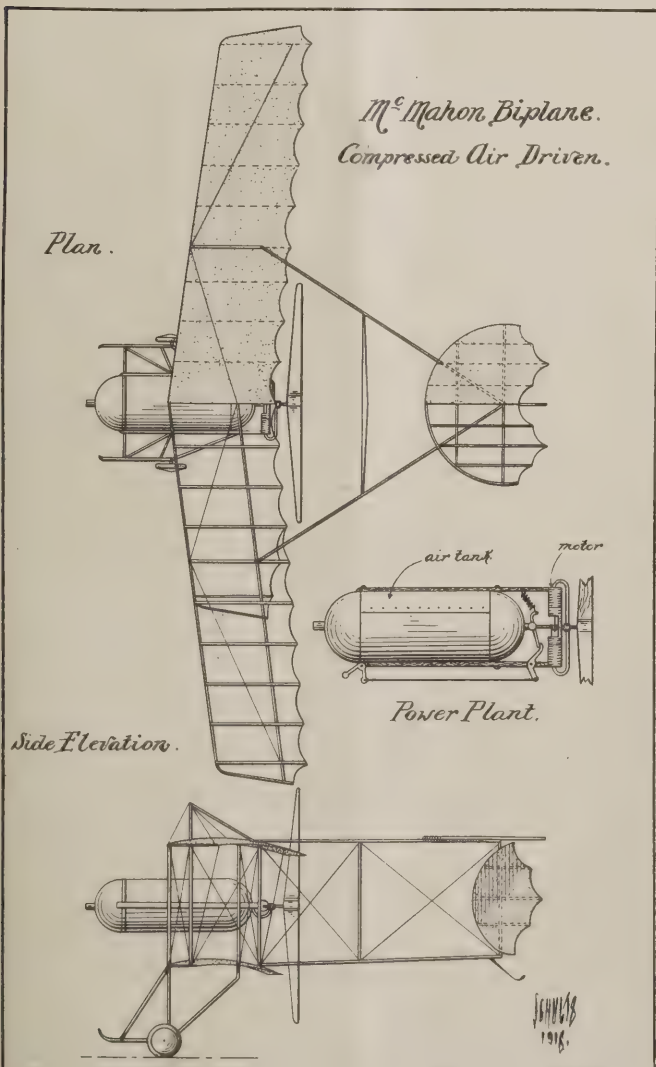
**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1717 Concord St., Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
c/o Christian Weyand, 48 Dodge Street, Buffalo, N. Y.  
**THE ILLINOIS MODEL AERO CLUB**  
Room 139, Auditorium Hotel, Chicago, Ill.  
**TEXAS MODEL AERO CLUB**  
517 Navarro Street, San Antonio, Texas

**SPRINGFIELD MODEL AERO CLUB**  
Springfield, Mass.  
**MILWAUKEE MODEL AERO CLUB**  
455 Murray Ave., Milwaukee, Wis.  
**CONCORD MODEL AERO CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**PLATTSBURG MODEL AERO CLUB**  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### The MacMahan Compressed Air-Driven Biplane

During the coming season the Aero Club of America is to award prizes to the amount of \$700 to the winners of model aeroplane contests. More than one-half of this amount is to be offered as prizes for contests held for mechanically driven models—that is, models propelled by means of compressed air motors, gasoline motors, and so forth. For the purpose of assisting the many model flyers who will doubtless want to take part in these events the following description with drawing has been secured through the courtesy of Mr. John MacMahan, a member of the Aero Science Club. Mr. MacMahan has had considerable experience in this field and in the accompanying drawing illustrates how neatly a model of this type can look and its exact resemblance to large machines.

The planes of this machine are single surfaced and covered with silk. The top plane measures 42 inches in span by 6 inches in chord. The lower plane is 24 inches by 6 inches.



Total surface of wings, 396 square inches. The spars are of 3/16-inch dowel sticks, flattened to streamline shape. Only two sets of uprights separate the wings, giving it a streamline appearance.

Both tail and rudder are double-surfaced, are built entirely of bamboo, and are very light. The tail is made in the form of a half circle and measures 12 inches by 8 inches.

Steel wire is used in the construction of the landing chassis, which is made in such a manner as to withstand any shock that it may receive in landing. The propeller is 14 inches in diameter, with an 18-inch pitch.

The motor is of the two-cylinder opposed type, and is so designed as to eliminate the necessity of using a heavy crankcase. The propeller is bolted direct to the crankshaft, which also acts as a rotary valve. Slots are filed on each side to admit and exhaust the air. The cylinders have one-half-inch bore and allow the pistons a stroke of five-eighths of an inch. The motive power is sufficient to spin a 14-inch propeller 2,000 r. p. m., giving a thrust of 10 ounces. The motor weighs but 1 1/4 ounces.

The tank is made of 28-gauge sheet bronze, riveted every one-half inch. The steel caps on either end of the tank, which are held by two long bolts, also act as an attachment to the spars that hold the tank to the engine. The tank has been satisfactorily tested up to 200 pounds pressure, but only carries a 150-pound pressure for safety sake. The tank measures 10 inches in length by 3 inches in diameter and weighs 7 ounces.

The machine complete weighs 16 ounces and measures 28 inches from front to rear.

Mr. MacMahan is now working on a carbonic gas motor, which he intends to use on a large pusher monoplane. This machine he contemplates using in the coming contests, anticipating a duration of over 50 seconds, with the possibility of flying from a quarter to a half mile.

### Aero Science Club of America

The coming competition to be held under the auspices of the Aero Club of America was the subject of discussion at the last meeting. Tentative rules for the competition were received, and these were very carefully considered. One or two suggestions have been outlined by the members, and these will be sent to the Contest Committee of the Aero Club at the earliest possible moment. Those present indicated their appreciation of the Aero Club's good intentions in offering these prizes to stimulate interest in the sport and science, not only by word, but by action, in the way of designing and constructing models which they will use in these contests. Messrs. Hodgins, Meyers, MacMahan and Schober are already working on the designs of motors to be used in the mechanically-driven model contests. A great many of the members are of the opinion that at the close of the coming summer a number of first-class motors for models will be in use.

Mr. Tismer suggested a contest for figure flying, and illustrated by sketches just how a model could be controlled by means of gears as to enable it to fly in any direction desired by a simple adjustment of the gears before the model is launched. This subject will be given further consideration. Mr. Schultz will in the near future make drawings showing how a model may be controlled by gears. These drawings will be published in AERIAL AGE.

Word was received from the Youngstown Model Aero Club, Youngstown, Ohio, stating that club's intentions of becoming affiliated with the A. S. C. This application will be considered at the coming meeting.

For further information concerning the club, address the Secretary, 29 West Thirty-ninth street, New York City.

(Continued on page 378)





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### No Desire To Proceed

An aviator was in the dock on a charge of landing on private property, and the case having been presented to the Court by the prosecuting solicitor, he was ordered to stand up.

"Have you a lawyer?" asked the Court.

"No, sir."

"Do you want a lawyer to defend the case?"

"Not partickler, sir."

"Well, what do you propose to do about the case?"

"W-e-l-l," with a yawn, as if wearied of the thing, "I'm willin' to drop the case, far's I'm concerned."

"No, sir, I don't believe in war!" cried the little man. "It means invasion and confiscation and a forcible and brutal alteration of existing boundaries."

The man across the way turned to his aviator friend and asked in a whisper who the little man was.

"He is a mapmaker," the friend whisperingly replied, "and he's got an immense stock of old maps on hand."

"My boy," said the elderly aeroplane manufacturer at the end of the lecture on economy, "when I was your age I carried water for a gang of section hands."

"I'm proud of you, dad," answered the gilded youth. "If it hadn't been for your pluck and perseverance I might have had to do something of the sort myself."



"EYE-WITNESS" AND GERMAN "WIT": HOW HIS DOG BARKS AT TAUBES!

"I am writing this despatch," "Eye-Witness" is here supposed to be saying, "with the roar of big guns around. Enemy airmen circle overhead. The British public will be interested to learn that my pet dog which I brought out with me can now distinguish a Taube from British aeroplanes. On seeing one, he gives three short barks as signal to our anti-aircraft guns."—Courtesy Illustrated War News.

#### Dangers of Modern Life.

Wife—Mercy! What's the matter with your face? You look at though you'd been in a battle.

Aviator—I was getting shaved by a lady barber when a mouse ran across the floor.

#### Looked That Way

"I want a man who doesn't smoke or drink," said the manufacturer.

"What are the wages?"

"Six dollars a week."

"Guess you want a man who doesn't eat, either."

#### Answer That!

"Carry yer bag?" said an eager urchin to a man hurrying towards the railroad station to get a train for the aviation field.

"No, thanks!" replied the man, shortly.

"I'll carry it all the way for tuppence," persisted the lad.

"I tell you I don't want it carried!" retorted the man.

"Don't yer?"

"No, I don't!"

The lad broke into a quick trot to keep up with his victim's hasty strides, as he asked, in innocent curiosity:

"Then what are you carrying it for?"

#### Aeronitis

"In the old days the main element of a soldier was to know how to act under fire."

"And nowadays, in addition, he has to know how to act under water, in the earth, and without air."—Puck.

Norah, fresh from old Ireland, stared at the baby's toy balloon, which wavered at a place two or three feet higher than her head, and was anchored to the back of a chair.

"'Tis quare and wonderful entirely!" she said, raising her hands, "to see it up and balancin' its own self—and it standin' on a string!"

#### Letter of a Mechanician

"Dear Slim—We got in this place they call Pumpknholler this a. m. The Con. knew we wanted to get off here, otherwise we wouldn't 'a' known it was here a-tall. The machine came along with us in a freight car hitched to the end of the train an' was in fine condition to accept, Slim, they had fergot to put the engine crate in along with it or more likelier, Slim, they started to put it in and then found it was pretty hev'y an' started to rest when mabe the train started to go and they was all to lasy to run after it, or mabe, Slim, they let it fall off on the way.

"I had to go over to their hardware, meat and clothing store they got here all in one and borry a gas chandeleer because one of the masts on the left upper wing got swiped and chandeleers is the only kind of a-lumnium tubing they got here an' they aint a-lumnium because their made of brass. I just turns the chandeleer upside down and fixes my gy-wires to the little spouts where the gas comes out and just makes a fine mast out of it. It looked great, too—reglar orneryment because their's three little pretty glass globes that sticks out and looks like flowers upside down. Mabe Bill dont think I urn my 10 per, eh, Slim? But I got the rest of the macheen up and balanced easy. That's the only hard part. Slim, getting those there wings balanced. Sometimes I have to tie a stone to one side of the wings and on the next date I have to tie it all over on the other side, because the macheen has got two senters of gravity, and it's hard tying the stones on because the nots slip all the time.

"HUSKIE."



# ANOTHER OFFICIAL WORLD'S RECORD



NEW MARTIN MODEL "S" SEAPLANE CARRIED 600-LB. LOAD 12,362 FEET HIGH IN ONE HOUR AND THIRTY MINUTES.

Other notable and unexcelled records established during the rigid Military tests before U. S. Signal Corps were:—

**TWELVE TO ONE GLIDE WITH DEAD MOTOR AND FULLY LOADED.  
FORTY TO SEVENTY-FIVE MILES PER HOUR SPEED RANGE, LOADED.**

Weight of Seaplane, Empty—2300 pounds.

Fuel Capacity—70 gallons. 630 Sq. Ft. Supporting Surface.

Motor Equipment:

THE NOTED SIX CYLINDER HALL-SCOTT 125 H. P.

Motor of Unusual Durability

MODEL S SEAPLANE COMPLETE—\$12,000.00

**GLENN L. MARTIN COMPANY**

**Los Angeles, California**

Hydro and Aeroplane Schooling the year round.

—Winner of Curtiss Marine Trophy—1915—

## MILITARY *Curtiss* TRACTOR

THE MODEL R  
BUILT FOR SPEED  
AND  
WEIGHT CARRYING

POWERED WITH  
CURTISS 160 H. P. MOTOR

SPECIFICATIONS ON REQUEST



**THE CURTISS AEROPLANE CO.**  
BUFFALO, NEW YORK



### Patriotic Aviators Volunteer Their Services

The first aeronautic organization of a military nature on the Northern Coast of the Pacific has been started through the patriotic action of Aviators Terah T. Maroney and Hubert Munter, of Seattle, Washington. They have announced their intention of taking service in the Washington Naval Militia under Commander W. B. Allison, the present head of the Naval Militia of that state. The aerial division will be organized and developed without any cost to the state, for the present at least, but it is expected that after its usefulness and necessity has been demonstrated the state will make adequate financial provision for its maintenance and further development.

Under the naval regulations, each naval militia district is supposed to have five flight officers and twenty-three other men, all of whom, with the exception of two, will have ratings in advance of those of ordinary enlisted men. The aerial section will be officered by an ensign, lieutenant (junior grade), lieutenant and lieutenant-commander.

"I appreciate more than I can express the patriotism of these young men in offering their services to the state," said Commander Allison. "Of course, we must crawl before we walk, and the only way we ever can have an aerial corps is to provide one, demonstrate its efficiency and necessity, and then ask the Legislature for an appropriation to continue the work."

"In order to provide the enlistment arrangements for Maroney and Munter, it will be necessary to take them into the regular establishment; after examination give them rating of machinist mates, then assign men from our two divisions to special duty with the aviation section, and then get along as best we can. This will be similar to the Provisional Machine Gun Company in the infantry, which is made up of men from other organizations assigned to special duty with the machine guns."

"I feel highly honored that these young men have chosen the Washington Naval Militia as the field for their operations, and I will bend every effort to the task of making their work successful and to the production of a well-supported aerial division in the near future."

### Aviators Took Photographs Along the Sound

The State police of Connecticut and Nils Chalmers, of the Federal Department of Justice are investigating a complaint made to the Federal authorities that an aeroplane carrying two men has been flying along the North Shore of Long Island and has taken photographs of Stamford and other points in that vicinity. The authorities want to determine the identity of the men and to ascertain their purpose in making photographs which might be of military value if they fell into the hands of a possible enemy. The authorities were moved to action by a letter sent to Washington telling of the work of the aviators. Neither the Federal agent who is investigating, nor Homer S. Cummings, the Connecticut State Attorney, to whom a copy of the letter was sent from Washington, will discuss the case other than to say that a complaint had been made and is being investigated.

### A Remarkable Midwinter Flight.

Hal R. Wells, general manager of the Grinnell Aeroplane Company, of Grinnell, Ia., reports a remarkable midwinter flight by W. C. Robinson in a new biplane manufactured by the Grinnell factory. With no idea of making a record flight, but flying merely to try out the new plane, Mr. Robinson ascended to a height of 14,000 feet, which approaches the American altitude record and is believed to be a new record for midwinter in this climate.

The recording barograph on the biplane showed that an altitude of 14,000 feet was reached after an elapse of one hour and thirty-seven minutes from the time the plane left the earth. When the high point was reached the supply of gasoline in the car was exhausted and the aviator then glided down the entire distance back to the earth. It took him about fifteen minutes to negotiate the drop of 14,000 feet, which is about the same as the drop from the top of Pike's Peak to sea level.

Three layers of clouds and three different directions of wind and variations of temperature were experienced in traversing the air between the earth and the altitude of 14,000 feet. There were hazy clouds and a drop of 10 degrees in temperature at a height of 3,000 feet and the wind shifted from southwest to northwest. Another layer of clouds with a rise in temperature of 20 degrees was experienced at a height of 6,000 feet. Above that point the temperature gradually dropped thirty degrees in the remaining 8,000 feet of the ascent. Most

of the last drop in temperature was experienced, however, between the altitudes of 12,000 and 14,000 feet, where a third layer of clouds appeared with a wind from the northeast which was just the reverse of the ground wind.

### Remained in the Air Nearly Nine Hours

Corporal Smith of the United States Signal Corps Aviation School at North Island, on Saturday went up in an hydro-aeroplane and remained in the air 8 hours and 42 minutes. The Aero Club of America will be asked to pass on Smith's flight, which establishes a new record. The American sustained flight record for the pilot alone in a machine of this type is held by Lieutenant John Towers, U. S. N., who flew for more than six hours at Annapolis in July, 1914.

### Aviation Show in Defence Interests

A military and aviation tournament in the interests of preparedness is to be held at the Sheepshead Bay Speedway from May 20 to 28. Nine men met on February 18th, noon, at the Bankers' Club in the Equitable Building and prepared the preliminary plans for a show that is expected to enlist the National Guard, detachments from the United States Army and Navy, and a number of aviators from various parts of the country as participants.

Harry S. Harkness, president of the Sheepshead Bay Speedway Corporation, offered to underwrite the expenses of the tournament and give the use of the park. An admission fee is to be charged and after all expenses have been met Mr. Harkness announced that "all net profits will be donated to the cause of preparedness or to some charity, as the State or Federal Government may designate."

Those present at the meeting were Mr. Harkness, Everard Thompson, manager of the Speedway; Horace M. Kilbourn, vice-president of the City Bank; Henry Woodhouse, governor of the Aero Club; G. R. Fearing, Jr., George P. Dillenback, A. T. Herd, C. E. Danforth and Major Hartley, U. S. A.

"We have been assured by Col. Glynn at Governors Island, Major-Gen. O'Ryan of the N. Y. N. G., and Commander Crank, U. S. N., that we will have the unlimited support of their services in our project," said Mr. Harkness. "Gov. Whitman has approved of it and promised to be present. Joseph Tumulty has given his approval and suggested that we write to the President for his indorsement. It is our plan to have the Governor and President as honorary guests and to invite Joseph H. Choate to be the active head."

In connection with the tournament Mr. Woodhouse announced that the Aero Club is considering establishing an aviation center at Sheepshead Bay on property near the Speedway, where aviation meets may be held every week. Such a location would be nearer the city than the present field at Garden City. He also said that Mr. Harkness had suggested Sheepshead Bay as the location for the New York station of the National Aero Coast Patrol, for which the Aero Club has raised funds. An offer of land and hangars for such a station has been made by Mr. Harkness.

### Building Airship to Circle the Globe

Porter Hartwell Adams, the aviator, of Boston, and who is at present in San Francisco, has made tentative plans for a trip by aeroplane around the world. He hopes to be able to make the trip in two weeks. Mr. Adams has a machine in process of construction at Bridgeport, Conn., and expects that it will be ready for flight in about three months. The proposed trip around the globe by aeroplane, Mr. Adams says, will cost about \$170,000.

(Continued from page 375)

### Illinois Model Aero Club

By ARTHUR E. NEALY.

At the last business meeting of the club it was announced that within the next two weeks the club is to give an exhibition of indoor models to the students of the Lane Technical School of Chicago. In view of the absence of Mr. Carleton, chairman of the membership committee, Mr. Josef Lucas was requested to take over the work of arranging the demonstration.

Mr. Cook, chairman of the contest committee, reported on the prospects of obtaining the use of the naval reserve boat "Commodore" for the holding of indoor meets, but in view of the approaching Villard competitions the opinion was voiced that this series be cancelled.

Mr. Nealy, chairman of Social Activities, announced that the next Scientific Lecture would probably be on power plants for models.

Mr. Laird tells us that he may be ready to fly in his new looper some time in March. Mr. Laird now has on his hands thirty-day contracts for the manufacture of tractors similar to his machine of last year.



G. DOUGLAS WARDROP

Managing Editor

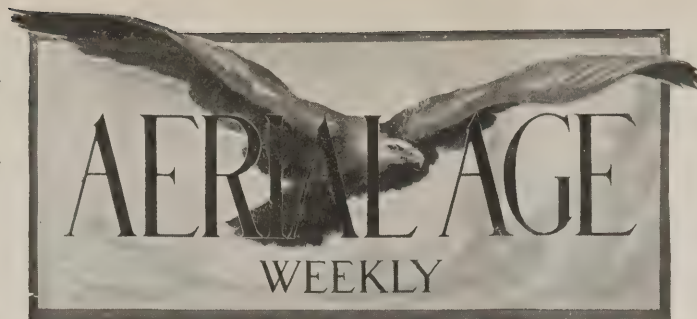
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No. 25

## Navy Department to Supply Gasoline, Oil and Hangars for Naval Militia

THE most important development since the movement to organize aviation sections in the Naval Militia was started, has just taken place. This is the decision on the part of the Navy Department to allow gasoline, oil, hangars, and certain kinds of repairs from Federal Funds.

This offer is contained in a letter just received by the Aero Club of America from Commander Frederic B. Bassett, Jr., head of the Division of Naval Militia Affairs of the Navy Department at Washington, D. C.

This offer is expected to add much impetus to the movement to establish aviation sections, not only in the Naval Militia but also in the National Guard—as it is expected that the War Department will make a similar offer to encourage the development of aviation sections in the National Guard. Twenty-two states have Naval Militia organizations, and forty-eight states have National Guard organizations.

In his estimate for the coming year, Captain Mark L. Bristol, Director of Naval Aeronautics, included an estimate for 46 aeroplanes for the Naval Militia. Unfortunately, Secretary Daniels slashed Captain Bristol's estimate, taking away the important and desirable feature to provide aeroplanes to "loan" to the Naval Militia.

Since the Aero Club of America instituted the National Aeroplane Fund, eight months ago, 24 states have taken up the matter of organizing aviation sections in the Naval Militia and the National Guard. The interest shown has proven that, given the opportunity and material assistance, the Militia will quickly develop the aviation side, and provide a valuable aviation reserve, organized on a uniform basis, so that in case of need, the aviation section of each state will be a unit of a mighty reserve air fleet.

The offer of the Navy Department contained in the letter of Captain Bassett follows:

1. Gasoline, oil, hangars, etc., necessary for the official flights of aircraft for training the Naval Militia may be allowed to those organizations having Aeronautic Sections or Divisions, under the following conditions:

- (a) For privately owned aircraft, even though they are owned by a member of the Naval Militia—stores and supplies will not be furnished from Federal Funds.
- (b) For privately owned aircraft which have been donated to a State, or loaned temporarily to it, under conditions whereby the proper State authorities will have the power to control and regulate flights taken by the members of the Naval Militia—gasoline, oil, hangars, etc., may be allowed from Federal Funds.
- (c) For aircraft owned by the State—gasoline, oil, hangars, etc., may be allowed from Federal Funds.
- (d) For aircraft presented to the Naval Militia by the Aero Club of America, or by others—gasoline, oil, hangars, etc., may be allowed from Federal Funds.

2. In case hangars belonging to the Navy are not available for loan to the Naval Militia of States having Aeronautic Sections or Divisions, and which have air craft owned or controlled by the State [see par. 1-(b), (c), and (d)],

rent for hangars necessary to house such aircraft may be allowed from Federal Funds.

3. Repairs, that are necessarily incident to the official flights of aircraft owned or controlled by the States, having Aeronautic Sections or Divisions [see par. 1-(b), (c), and (d)] may be allowed from Federal Funds, but this does not mean that aircraft which may be destroyed, or so badly injured as to necessitate a practical reconstruction, will be replaced or rebuilt.

4. "Shipkeepers" cannot be detailed for aircraft that are not the property of the United States, but in accordance with Section 17 of the Naval Militia Act, the Secretary of the Navy may detail officers and enlisted men of the Navy for duty in connection with the Naval Militia of States having Aeronautic Sections or Divisions, upon the application of the Governor.

5. The Division of Naval Militia Affairs is to be the sole judge of whether the State has sufficient control over aircraft in the possession of the Naval Militia, as to justify the allowance of Federal Funds, for their upkeep, and for the furnishing of the necessary supplies. In order that no mistakes may be made, it is requested that all aircraft in the possession of the Naval Militia be reported to the Division of Naval Militia Affairs, together with the following information:

- (1) Type of machine, including designer's name and manufacturer, also register number.
- (2) Horse power of engine, number of engines, etc.
- (3) Owner, giving information in full as to conditions under which the Naval Militia are allowed the use of each machine.
6. No supplies or repairs of any kind will be allowed the Naval Militia having aircraft in their possession until the information requested in paragraph 5 above, has been furnished.

F. B. BASSETT.

### Curtiss Company to Train an Aviator for Each State.

THE Governors of the various States have received a letter from Mr. Alan R. Hawley, president of the Aero Club of America, informing them that the Curtiss Aeroplane Company, of Buffalo, N. Y., has offered to train an officer of the Militia of each of the forty-eight States.

This training will be given on either land or water aeroplanes at any of the following points, at which Curtiss aviation schools are located: Buffalo, N. Y.; Hammondsport, N. Y.; Newport News, Va., and San Diego, Cal. Another school will be established at Sheepshead Bay Speedway, New York City, in the Spring. This training will continue until the officer appointed secures his official pilot license, which is issued by the Aero Club of America. Such a course is worth \$400.

Through the generosity of Mr. Emerson McMillin, of New York, it is possible for the Aero Club of America to add 10 per cent to this \$400. The check for \$40 will be sent to the adjutant-general of each. State upon receipt of advice that the officer is ready to report at one of the Curtiss schools for

**America Must be Given a Navy Equal to the Best.** If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.



his training. This amount is to go toward defraying expenses incidental to his training.

This contribution of the Curtiss Company to the National Aeroplane Fund will add forty-eight trained militia officers to our aerial forces, as well as enable the militia of most of the States to take the first step toward organizing an aviation section.

In his letter transferring the offer of the Curtiss Company, President Hawley points out that:

"The aeronautical equipment of the Army and Navy consists of less than twenty aeroplanes in commission, and a dozen ordered, which are needed to replace some of the aeroplanes in commission. The plans being considered by the present Congress aim to only provide less than 200 aeroplanes to the Army and Navy combined. No provision whatever is made to provide aeronautical equipment to the Militia.

"The National Aeroplane Fund will continue until the need has been met by the Government. As no provision has been made so far by Congress it will probably again be necessary this year to supply trained aviators to participate in the summer maneuvers of the Militia. The only way to meet the need is to meet it, and we have no other alternative excepting to assist the Militia in developing aviation sections through public subscriptions. We do this willingly, protesting only against the Federal Government's failure to meet this need.

"Since the National Aeroplane Fund was started eight months ago, twenty-four States have taken up the work of developing aviation sections in the Militia, and in most cases there has been fine and continuous progress, which no doubt will continue.

"As the public sees that Congress fails to meet this very pressing need, it contributes gladly to make it possible to provide aeroplanes to the Militia.

"The substantial support given to the National Aeroplane Fund has shown that the public is in favor of developing aviation in the Militia, and the general feeling is that the Government should provide the proper aeronautical equipment in the Militia—a feeling which is shared by the Aero Club of America.

"But it is being realized that if the Army has only about ten aeroplanes in commission at the end of seven years, when it should have 1,000, and the Navy has only about ten aeroplanes in commission at the end of five years, when it should have 2,000, at this rate it would take the best part of 1,000 years to supply the Army's and Navy's aeronautical needs. The Army, Navy and Militia need \$25,000,000 for aeronautics. Less than that will leave this country behind the third and fourth class powers, who now have many times more aeroplanes than this country has.

"It is generally appreciated that so long as the Army and Navy are so short of men, the Militia forms the backbone of our defenses. There is also being appreciated the fact that the efficiency of the Militia can only extend as far as the means provided for equipment and training will reach.

"Conditions being as critical as President Wilson states them, this country needs immediately five thousand trained aviators. Had this country a reserve of five thousand trained aviators, it would be in the happy position of the porcupine, which spends its days in peaceful pursuits, harming no one, but is ever ready to defend itself.

"Assuring you of our hearty co-operation in any way possible toward the successful establishment of a sufficient aviation detachment to your Militia."

#### What Our Flyers Are Asking

*From Army and Navy Journal.*

THERE are available in this country, including the officers and enlisted men in the Army who have qualified, but 358 persons who have air-pilots' licenses. The Army's expert fliers number only twenty-three officers and five enlisted men. The number of professional citizen fliers—men who make their living out of flying—is put at twelve to fifteen. And of the grand total of 358 fliers in the country a very small percentage have ever done cross-country work. These are some of the facts with regard to the woeful shortage of aviation equipment and personnel which were presented to the House Military Affairs Committee by Brig. Gen. George P. Scriven, Chief Signal Officer, U. S. A., and Lieut. Col. Samuel Reber, of the Signal Office, on January 18. And although the Army to-day has but twenty-five machines which are listed as

fit to fly, the capacities of the several aeroplane factories in the country are twenty a day, the Curtiss factory alone being able to supply ten machines daily. It is possible to get the machines; given needed reformations of the law, it is even possible to get the officers and men to fly them, not only in the Army, but in civil life, the officers told the Congressmen. But as matters are at present the Aviation Section of the Signal Corps is under-manned, short of machines and wanting money to make ordinary needful repairs, as well as to purchase the new equipment required with a view to efficiency.

General Scriven said that the Army needed five full squadrons of aeroplanes, according to its present organization, each squadron to have twelve machines—more than twice as many as it actually has—and a complement of forty-six officers and 462 men beyond the present strength. This would allow a squadron for each of the five tactical divisions in the Army, but would not make any allowance for the three Coast Artillery Districts, or the Field Artillery, which would require, all told, an addition of nine squadrons. Under the War Department's scheme for reorganization of the Army, moreover, the total called for would be eighteen squadrons, with a total strength in the section of 368 officers and 2,360 men. The present recommendation of the War Department is for seven squadrons, with 133 officers and 710 enlisted men. General Scriven said he would have no difficulty in getting the officers if the restrictions as to age and marriage were removed. He went at length into the figures in this matter, which were published fully in his annual report. He admitted the shortage of available trained citizen material and the lack of aviators in the National Guard; but gave it as his opinion that a reserve force such as he had outlined in his report would fill the bill. There is no doubt as to the ability of the Army to get aviators if it ever wants them, but aviators require six months to train, and the service is expensive, in that new machines cost \$10,000, about \$5,000 for upkeep, are liable to serious accidents and breakages and have exhausted their useful life at the end of one year. The appropriation for aviation purposes which the Signal Corps asks, \$1,358,000, seems to us remarkably modest in the circumstances. There is no provision in it for reserve machines, of which the foreign governments keep two for each machine in active use. It is proposed under this appropriation to bring the resources of the section up to a total strength of about ninety-two machines—seven squadrons of twelve machines each and eight extra machines for the training school. The weakness of this policy is apparent at once. Whenever an accident to a machine occurs the crew of that machine will have to wait months for a new machine, because of the fact that there are no spare machines held in reserve for just such an emergency.

All of the machines in use in our Army are biplane tractors. Owing to lack of funds there does not seem to have been any of the far-seeing experimentation with different types which would appear to be advisable, judging from events abroad. Both Gen. Scriven and Lieut. Col. Reber told the committee that foreigners were turning more and more to the biplane as the ideal flying machine; but this does not alter the fact that we appear to be practically devoid of such useful units as the great weight-carrying bombing-machines employed so successfully by the British and French, or the extraordinarily fast aeroplane-destroyers and scouting machines. Our equipment appears to consist practically entirely of reconnaissance machines of medium speed and two-passenger capacity. The lines of experimentation to be pursued in the future were indicated by Gen. Scriven when he said that he was convinced that Zeppelins and dirigibles of all kinds had been failures in this war, in proportion to their expense, as contrasted with aeroplanes, and that he had been assured by Mr. Santos-Dumont that machines had been devised in Europe with a free weight-carrying power of three tons. Such machines could carry either a light cannon, with plenty of reserve shells, or else a heavy load of detonating and incendiary bombs, and it would seem to be obvious that our Army should be afforded an opportunity to experiment with them.

The major needs of the Aviation Section as disclosed by Gen. Scriven and Lieut. Col. Reber are (1) more money for equipment; (2) additional officers and men to man the amount of equipment required to furnish efficient reconnaissance assistance to our Army as organized at present; (3) alterations in the law for detailing officers from the line, so that the age limit would be removed and married officers might come in; (4) constitution of a fund for experimental purposes under the Aviation Section's direction; (5) organization of a reserve flying corps and institution of training for National Guard officers.



# THE NEWS OF THE WEEK

## Aeroplanes Exported in a Week.

During the week ending February 19 there were shipped from the port of New York aeroplanes to the value of \$251,846. The relative importance of the week's exports of aeroplanes is better understood when the total value is compared with that of automobiles. During the same week the total value of the commercial automobiles exported was only \$180,101, and the total value of the passenger automobiles was only \$166,529.

## The Yale Aviation Corps

At a recent meeting of the Yale Aviation Corps, held in New Haven, Lieutenant Slocum outlined the work that is to be done. The corps will be composed of twenty men in the Yale battalion, and twenty who are not. The selection of competent men will be made by Major Danford. The dirigible, furnished by the Connecticut Aircraft Company, will be set up in the State Armory in Hartford, where there will be practical instruction in the essentials of aircraft management. Eight men will make up a squad, which will work under the direction of the pilot. Each man is expected to report at Hartford at least four times, and must appear in regulation uniform.

Later in the year, the study of the kite balloon will be taken up in New Haven. Observations are taken from it and are reported by telephone to the men who are directing the fire below. Before the summer vacation several ascensions will probably be made in New Haven.

Lieutenant Slocum read a telegram which was received from Washington, saying that the Government was keenly interested in the aviation corps in connection with the Yale batteries and would send representatives to inspect the work at Hartford.

## Dr. Walcott Advocates Larger Navy Appropriation

Dr. Charles D. Walcott, Secretary of the Smithsonian Institution and a member of the National Advisory Board on Aeronautics, recently appeared before the House Committee on Naval Affairs at Washington. He asked the committee to appropriate an additional \$85,000 for the completion of the board's work in the investigation and development of the science of aeronautics.

"Even if the army were equipped with 100 aeroplanes," said Dr. Walcott in a general discussion of the use of aircraft. "I would not consider that it was anywhere near adequately outfitted."

The purpose of the special board, he explained, was to bring under one head all the scientific research necessary for the

development of aeronautics. Such investigations, he said, are now more or less scattered, and they should be co-ordinated by the Government as a part of the defense plans.

"How quickly can we obtain the necessary information to help men like myself who want to advance this cause?" asked Representative Butler of Pennsylvania. "How can we get the information that will bring this service to the height of its efficiency? To whom shall we apply?"

"One of the objects of this advisory commission is to find the right men," said Dr. Walcott.

Dr. Walcott aroused Representative Callaway, a "small navy" member of the committee, by saying that the Thirty-fourth Division of the Turkish Army had fallen into a "Russian trap" near Erzerum.

"If the Turks had had just one aeroplane they could have avoided this trap," commented Dr. Walcott.

Representative Callaway said he regarded it as a remarkable coincidence "that the papers should play up a thing like that on the very morning this committee was going to meet and consider the subject of aeroplanes."

"Do you mean to say," interposed Chairman Padgett, with unfeigned surprise, "that the Turks allowed themselves to be captured for lack of aeroplanes simply for the benefit of this committee?"

"No, I don't mean that," said Mr. Callaway, hastily explaining. The Texas member then launched into a criticism of newspapers and the general accuracy of their reports regarding such topics as the war and national defense.

## Kite Balloons for the Battleships

The Navy Department has ordered what will probably be the first of a number of kite balloons to be used to increase the accuracy of gun-fire. This first balloon will be used during the spring target practice, and it is expected that others will be added to the equipment of the battleships if the results are satisfactory. At present the officer observing the fall of shots is stationed in the fighting top 150 feet above the decks of the ship, but with the kite balloon he can be sent up 1,000 feet and report the range of fire to the ship by telephone. From this height it is thought by the experts that deadly accuracy may be attained while firing at targets that are invisible from the decks.

Another new feature probably will be added to the fleet this Spring, when the armored cruiser North Carolina, carrying six aeroplanes and their crews and a device for launching the aircraft in any weather, joins Admiral Fletcher's command. The aerial scouts for the first time will play an important part in the maneuvers.

A view of the delta of mud at the head of San Diego Bay, where the flood waters swept into the bay, photographed from a Curtiss flying boat piloted by Raymond V. Morris. In the extreme right of the background can be seen the flooded Mexican town of Tia Juana, and the new American race track at that place which was destroyed.







Miss Anna Fitzu, of the Metropolitan Opera Company, who sang so charmingly at the Carnegie Hall Defense Rally last week.

#### Sturtevant Four-Cylinder Aeronautical Motor

The B. F. Sturtevant Company of Hyde Park, Mass., are now producing a 100 H. P. eight-cylinder, V-type, four cycle, water cooled aeroplane motor, the general construction of which is the same as that of the Sturtevant Model 5, 140 H. P. motor.

This motor develops 100 H. P. at approximately 1450 R. P. M., the propeller being fastened to the crankshaft, whereas on the 140 H. P. engine the propeller shaft is driven through a reduction gear.

The 100 H. P. motors have been specified for installation in the U. S. Navy School machines, recently ordered from the Sturtevant Aeroplane Company of Jamaica Plain, Mass. The carburetors on the Navy engines are gravity fed, being located beneath the bed of the engine and connected to the cylinders by means of special water jacketed manifolds.

These motors are also being supplied with the standard carburetor installation as is used on the 140 H. P. engine, the carburetor being located between the cylinders and supplied with a liberal amount of hot air from the exhaust so that the mixture is not affected by changes in weather.

#### Burgess Warplanes at Pensacola for Tests

Shipment of the rush order of six school machines by the Burgess Company, of Marblehead, to the Navy Aero Training Station at Pensacola will be completed this week. W. Starling Burgess, the designer, and Clifford L. Webster are now at the station in connection with the official trials of the Burgess-Dunne warplanes, of which three reached Pensacola last month.

The new school craft are strictly training machines and especially designed for that purpose. Their large surface area gives them a low minimum speed, about forty miles an hour, while their 100 horsepower Curtiss OXX motors will drive them at a maximum of 65 miles an hour. The surface area is a little more than 500 square feet, while the total weight with full load is 2,500 pounds.

A novel departure for the United States Navy is the fact that the new craft are of the tractor type, while hitherto the Navy planes have been confined to "pushers." They are hydro-aeroplanes with two pontoons below, and are so constructed as to be easily converted into land machines by a simple change in the chassis.

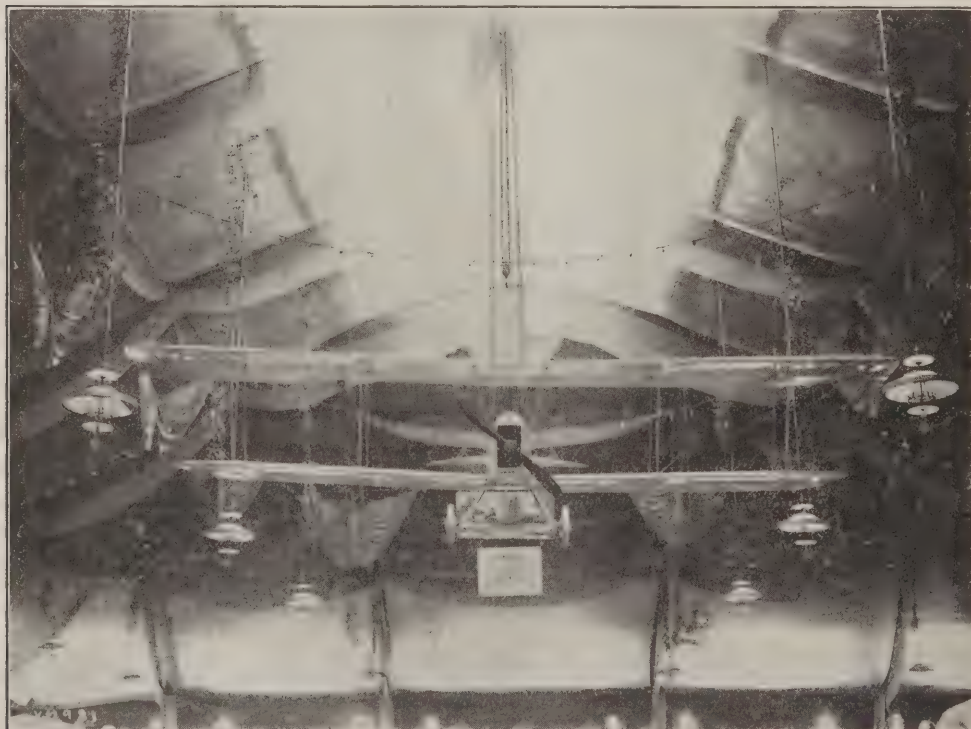
The controls are of the so-called Deperdussin type, that is, with the ailerons operated by a footbar, and the elevator and vertical rudder actuated from a steering column carrying a wheel. The seats are in tandem in the stream-line fuselage, with the motor in front and the radiator in advance of the engine. The power plant, in fact, very strongly reminds one of that on an automobile. The resemblance is heightened by slots in the side of the "hood" to allow air, passing through from the radiator, to escape.

In the forward seat sits the teacher, with the pupil behind him operating duplicate controls which can, of course, be instantly thrown out of service from the governing seat in front. In this wise, the learner can watch the motion of the pilot, then gradually take over the control of the machine until he is flying it alone.

There are many interesting new details of construction, not the least important of which is the thorough rust-proofing of all parts mentioned in these columns last week. Every fitting in the Burgess school machines down to the smallest bolt and nut is treated with this process, not only adding immeasurably to the safety of the pilot and passenger during flight, but prolonging the life of the machine many months, as well.

The total load carried is approximately 550 pounds, of which 350 are allowed for pilot and passenger, and the remainder for fuel and oil. As the maximum consumption is a little less than 70 pounds of fuel and oil per hour, the design gives a sustained flight of three hours. Replacing the weight of the passenger by fuel more than doubles this total, owing to the constant decrease in the load.

The gliding angle, also a result of the large area and peculiar design, is one in seven with full load, so that from the height of a mile the operator can reach a point, under neutral con-



The tractor biplane presented by Mr. Inglis M. Upperco, of the Aeromarine Plane & Motor Co., to the Naval Reserve of New Jersey, on exhibition at the Newark Automobile Show last week.



ditions, seven miles distant when he shuts off his power. This is another important point for a training machine. With the lessening of the load, of course, or when the machine is flown single, the gliding angle goes up to between one in eight or nine.

The climbing rate is designed for about 400 feet a minute, a very large maximum for any craft of the marine type, which is hampered by the additional weight of its pontoons, frequently augmented by water clinging to the surface, or at times, leaks which partially flood the compartments.

Tests of the machine have been made at Marblehead under the operation of Aviator W. E. Johnson of the Curtiss Company, loaned for the purpose. Mr. Johnson is one of the most prominent of the later day American pilots, and has most recently been engaged in the trials of the huge new Curtiss war planes built at Buffalo for members of the Entente Alliance.

#### Aviation at Long Beach, Cal.

William Meyer, a 16-year-old lad, who weighs but 60 pounds, is learning to fly under the instruction of Earl S. Dougherty at Long Beach, Cal. This pupil is so small that he has to use several pillows to raise him high enough to see out of the cockpit, but he is a very nervy little chap and gives every indication of making an excellent aviator.

Harry Christofferson has been doing a lot of passenger carrying on the beach.

J. W. Boyd has just purchased a new 26 ft. Curtiss machine and has installed in it the 60 H. P. Hall-Scott motor, used by Frank Stiles.

The beach and the weather conditions are ideal for school work and passenger carrying. With Mr. Dougherty's two machines, a tractor biplane and Borel Morane monoplane. Harry Christofferson's two Curtiss type biplane and J. W. Boyles' Curtiss type biplane, it is expected that there will be a lot of flying at Long Beach during the coming summer.

#### Motor Expert Engaged by the Packard Company

William R. McCulla has been engaged by the Packard Motor Car Company to act in the capacity of aircraft motor engineer.

During the last year and a half Mr. McCulla has been assistant chief engineer for the Knox Motors Company of Springfield, Mass., and during that connection he spent eight months abroad studying aviation motors under actual warfare conditions. Prior to that Mr. McCulla was assistant research engineer to the Packard Motor Co. He was first recognized in the engineering world as one of the Hudson "forty-eight" engineers, under J. G. Vincent, who is now vice-president of the Packard Motor Car Company. Mr. McCulla came to this country in 1907 as motor expert and racing driver for the Darracq Company of France. Starting in the business in 1899 with a three and one-half Benz, he worked up through



Miss Elizabeth Wood, daughter of Mr. and Mrs. Henry A. Wise Wood, whose engagement to John Cyrus Distler has been announced.

the racing game, ending with the 20 H. P. eight-cylinder Darracq in 1906.

#### The National Aeroplane Fund

The following contributions to the National Aeroplane Fund have been made since February 18: C. A. H., \$2.00; H. R. Labouisse, \$25.00; Alice Hunt Bartlett, \$400.00; J. Kearsley Mitchell, \$100.00.

Subscriptions to this fund should be addressed to the National Aeroplane Fund, 297 Madison avenue, New York City.

#### Puget Sound Aeronautic News.

Herbert Munter has been making daily flights in the Northwest Aero Club's rebuilt Martin tractor. The machine now has a span of 42 feet, the same as the regular Martin model, having been reduced ten feet. The reduction of the surface and the new Hall-Scott motor have resulted in an exceptional increase in the speed, necessitating careful piloting. The new two-step pontoon planes much more readily than did the former with three steps. Mr. Munter will soon try for his pilot's license on his own Curtiss type land machine.

The Sturtevant All-Steel Battleplane, equipped with 140 H. P. Sturtevant motor, preparatory to making a flight at Jamaica Plain, Massachusetts.





# Aviation in Japan as Seen by Charles F. Niles

CHARLES F. NILES, the aviator, who has so stirred up all Japan by his marvelous flying that he is fêted and banqueted wherever he goes and is proclaimed as "the God of the Air," writes to AERIAL AGE to express his great pleasure over the strides that aviation is making in the United States and his regret that the government at Washington is unable to see its great opportunity.

"I am very glad," he writes, "to read in AERIAL AGE of the wonderful success of aviation in the States. It surely does my heart good. I myself am burning up with a fever to get back and start manufacturing in dear old America. My heart leaps to think that the people of little old New York have put the buck in it at last. Your paper surely deserves a powerful lot of credit for its good work."

"I am very sorry to hear that Congress has cut the appropriations for aeronautics terribly. If America does not support the manufacturers of planes and motors, how can they expect to have others? We must look to the present war to keep prosperity in aeronautics, just because our own government will not give us a tenth of what is wasted in the pork barrel, and all the world knows how badly the aeroplane is needed in our Army and Navy! Everybody should push the movement to make America first in aeronautics, and that movement should not be obstructed by a few narrow-minded politicians. We have all of South America to sell to. Canada, Russia, Japan, China and the Netherlands are also in the market. If our product is the best after the war these countries will come to us to buy. Europe gave the industry a start, and now our government is too stupid to see the real situation. We in America can build faster and cheaper than any other country in the world, and at the same time pay better wages to our workmen. In no other country have I seen such speed in manufacturing as in the United States. In her largest ammunition factories Japan copies our systems.

"Japan and China are in the market today for aeroplanes. A certain government official offered to purchase both of my machines for school and scouting work. Even after he had been informed that they were not suitable for that work, he was still anxious to purchase. What does this mean? Somebody is asleep at the switch. There is a market here with no one to take care of it.

"Williams and Holmes (American aviators in Japan) can not find capital here. The Japanese will not finance Amer-

icans. They are not the people to take chances and are very near-sighted in such matters. One man here, a native, has built an exact copy of the La Rhone motor and it is an admirable machine, but no one will finance him, though he is a man of good standing, the son of a silversmith. At a banquet given by the leading papers of Japan I made a speech, in which I told them that they were near-sighted, with the result that a capitalist connected with one of the papers has put 50,000 yen into this man's business.

"China wants planes for use in her Civil War and I have an opportunity to build here for China, but the troubles—language, the slowness of the people, lack of modern equipment, etc.—are too many for me.

"A word about my own work. I have flown in the principal cities. We had 500,000 spectators at Tokio and 170,000 at Osaka on our last day. The show was practically free. The people are too poor to pay, so the newspapers and the cities pay for the exhibitions and the government gives us soldiers for policing. They have been very nice to us.

"My managers are pounding away on China, but it is too cold there. We have engagements pending in Manila and Formosa. While my managers are busy arranging for new business I am playing with a Morane-type 80-h.p. Rhone motor. This machine killed its pilot and the owner was afraid of it, so he asked me to fly it. I have made some changes in it, tuned up the motors and went up 10,800 feet in it with its owner, breaking two Japanese records. The old record for the Kingdom was 10,000 feet with the pilot alone. Since then I have made several important trips in it, one over a range of mountains.

"The people have been extremely kind to me. One newspaper has presented to me a medal, and a silver tea service. At every banquet I tell the Japanese about their rotten 'booze' habits and about their flattery, and they seem to be amused by it. Banquets and speeches are the regular thing. The Tokio government college has invited me to make an address there.

"There are only two native aviators here who are at all competent. The army aviators are all flying Farman box-kites. They have about 26 of them. There is life and action in the naval section. The captain in charge learned the business with Curtiss at Hammondsport, and just now he is sending a representative to Buffalo to purchase."





# FOREIGN NEWS

By JAMES E. CLARK



## FRANCE.

Probably the day of greatest aerial combat thus far known in the war was February 20, when seven great air battles were fought over the fields of France in which it is estimated over seventy aeroplanes participated. During this period one Zeppelin was struck and fell, a total wreck, and four aeroplanes were brought down by the Allies. A feature of both military and commercial interest is that most of the fighting was done between squadrons of large size, though in the case of the Zeppelin the pursuit and victory are to be credited to the crew of an automobile. The official French bulletin laconically tells the story of twenty-four hours in the history of military aviation that cannot fail to be of special significance to all observers interested in the development of aeronautics:

"The day was marked by a number of air fights. Over Tagsdorff, east of Altkirch, one of our aeroplanes, attacking a Fokker at close quarters, fired fifteen shots at him. The enemy machine slipped over on its right wing, then fell.

"In the region of Epinal an Albatross machine was brought down by our artillery fire. In the region of Bures, north of the Forest of Parroy, a German machine attacked by two of our machines was brought to earth in our lines. The pilot and passenger were killed.

"A squadron of seven aeroplanes gave combat to four enemy aeroplanes in the region of Vigneulles-les-Hattonchatel. Two of the latter were forced to make a landing. The other two took to flight.

"Enemy aeroplanes have bombed Fismes, Bar-le-Duc and Revigny. Near the last named place an enemy squadron composed of fifteen machines was attacked by one of our pursuit squadrons and was forced to give fight, in the course of which a German machine was beaten down near Givry-en-Argonne. The two aviators were made prisoners. A second enemy aeroplane was pursued into its own lines.

"One of our bombing groups, composed of seventeen machines, dropped sixty-six shells of heavy caliber on the aviation field at Habsheim and on the freight station at Muelhausen. Another group of twenty-eight machines dropped a number of projectiles on an enemy munition factory at Pagny-sur-Moselle. Following these different operations all our aeroplanes returned to their landing ground."

A squadron of five French aeroplanes bombarded the munitions depots of the enemy at Chateau de Martincourt and at Azoudanga (southwest and southeast of Dieuze). In the same period German aeroplanes dropped some projectiles on Luneville, Dombasle and Nancy.

During the same period twenty-six British machines made a raid on the enemy depots at Don and the official report states they believe at headquarters that the damage done to the railways and to the military stores was extensive.

The approach of the Zeppelin L-Z 77 toward the French positions near Revigny on the night of February 21st, nine miles northwest of Bar-le-Duc, was detected by an officer at a listening post. The destruction of the ship was accomplished by an anti-aircraft battery racing along a country road in the dark with the gunners working while lying flat on their backs in the bottom of the car. The officer at the listening post reported his finding to the artillery base. The captain of an artillery battery first picked up the ships flying at an altitude of 5,000 feet. One was two miles away; its companion ship was three miles in the rear. The artillery captain was unable to get the altitude for effective firing, but he gave the exact location to the searchlight operators and the latter soon showed the first of the two ships moving moderately across the sky in the face of a strong wind. Meanwhile five automobiles carrying special aircraft batteries and manned by naval gunners started out in pursuit.

"The guns on the moving automobiles opened fire as soon as they came within range," said an eyewitness. "A shell burst just behind the Zeppelin, throwing it into strong relief, and immediately the gunners seized their opportunity. Another shell passed over the target, but the next, of the inflammable type, hit the mark squarely about seventy-five feet from the stern.

"There was a shout of triumph from the Frenchmen as the shell appeared to go through the body of the airship and to adhere to the right side of the framework, which it set afire. A few seconds later two other shells went through the rear of the car, badly damaging the steering and elevating mechanism.

"For an instant nothing seemed to happen, and then a thin red line crept along the side of the airship, which shone with a bright ruddy glow as the flames spread and moved upward. No explosion was heard as the Zeppelin began to fall. The great mass, now blazing more and more fiercely, descended slowly, while burning fragments of the cover fluttered away in the wind, and all the onlookers expressed surprise that the airship took so long to come down.

"The cargo of bombs, which there is reason to believe were to have been dropped on the inhabitants of Paris, exploded with a terrific roar as the Zeppelin struck the ground. Fragments of the car were hurled over 2,000 feet away, and the remainder of the huge framework collapsed in a heap, the fire continuing to burn for several hours.

"All of the crew, estimated to number at least thirty-five men, were burned to death before reaching earth.

"The second Zeppelin, which had witnessed the disaster to its companion, turned tail and hurried back to the German lines and there was no raid on Paris that night."

## GERMANY

Just how many aeroplanes Germany possesses is a military secret, but from South America there comes a report that the military attache of one of the German legations there said in commenting on the statement that Great Britain was about to build 10,000 aeroplanes, "We have 9,000 ourselves. The great speed with which all nations have been building aeroplanes for military purposes and the secrecy which the war has imposed make it impossible to give accurate figures as to the number of machines actually in commission, but there are many observers who think that the total number owned by any one of the warring nations is greater than the public is prepared to believe. There is, however, an exception in the case of Russia who lost the initiative in its drive toward the

heart of the German empire by reason of the fact that it had so few aeroplanes. Along the Russian front Germany is holding the trenches with thin lines, but it has 2,000 aeroplanes hovering overhead, and is thereby able to give German headquarters ample notice of any movement of enemy troops so that the lines may be strengthened at the point of attack.

Count Zeppelin expects to visit New York within the next three years and to make the trip across the Atlantic in one of his airships. This statement is made by Judge Ben B. Lindsey, who recently returned to America from a visit in Germany. The Count is confident that within three years or less it will be entirely possible to visit New York by the Zeppelin route. Judge Lindsey was permitted to visit one of the bases of the German air fleet in Bitterfeld, Prussian Saxony, where he saw a Zeppelin that he was told had made the journey all the way from Bitterfeld to London and back last fall without stopping. In an air line the distance is estimated at 1,000 miles. Prominent Germans, Judge Lindsey says, are talking about a prospective air raid on London in the near future in which twenty-five Zeppelins and a large number of aeroplanes will take part.

A dispatch from Amsterdam contains the information that Germany has new and enlarged factories from which Zeppelins are being turned out at the rate of two a week.

The wreck of the Zeppelin L-19, which a trawler saw sinking in the North Sea soon after the raid of January 19th on England, was due to the failure of the motors, according to a statement from Capt. Uhle, who was in command of the dirigible and who was lost with all of his crew. There has been picked up in the North Sea a bottle which contained four letters—two for the parents of Capt. Uhle, one for his wife and one for his son. The letters were written at successive periods. The third letter said that the airship was 100 meters above the water, that the motors had failed to act, and that he expected the craft to drop at any moment. The fourth letter said that the dirigible had dropped into the water and that he crew were drowning.

## GREAT BRITAIN.

Lord Derby has accepted the chairmanship of the joint naval and military board to control the British air service. He will serve without salary.

Twenty-six British aeroplanes recently attacked the depots at Don damaging stores and railway property.

## ITALY.

The Nuncio at Vienna, in compliance with instructions from the Pope, will inform the Austrian Government that the campanile of St. Marks in Venice is not used for anti-aircraft defense purposes, and the Nuncio will also ask the Austrian Government for its reasons for the aerial attack on Venice, and for air raids on other undefended cities of Italy.

In retaliation for numerous violations of international law by the enemy, the Italian army sent an air squadron to raid the town of Laibach. Scores of bombs were thrown on the town. One of the attacking machines was, however, surrounded by six Austrian aeroplanes and was captured. For his gallant conduct in this raid the King has awarded the medal for valor to Capt. Salomone, who piloted a large machine carrying four men. It was the duty of this machine to engage the aeroplanes of the enemy so that the other units of the Italian squadron could proceed with the bombardment of the town. Capt. Salomone accordingly attacked several Austrian aeroplanes that arose to the defense of the city. In the battle which ensued two of his companions were killed and he himself was wounded, but notwithstanding his injury, a wound on the forehead, he maneuvered his machine so successfully that the observer, Col. Barbieri, was able to keep up a steady machine gun fire on the enemy's aeroplanes. Presently the observer fell dead across one of the steering wires. Moving the bodies of two of the men so that he would be unhampered in his control of the machine, Capt. Salomone, having sufficiently delayed the pursuers so that the other Italian machines could reach their objective, he landed at Palmanova and was taken from his machine in a fainting condition.

## JAPAN.

After making two unsuccessful attempts to get up, a new airship, the Youhi, recently succeeded in gaining the proper altitude and flying from Tokorozawa to Osaka, carrying Major Masuda and six other officers of the aviation battalion. The start was made at 1:20 in the afternoon and Hamamastu was reached at 6:40 when a stop was made to replenish the gasoline tanks and to examine the engine. At 11:30 the same evening the journey was resumed and Osaka was reached at 4:05 the following morning without a mishap.

Two aeroplanes which army officers had been using in practice work were wrecked by a cyclone near Odawara. For shelter from a gale which was blowing they were placed in a pine forest on the beach, fastened to the ground with pegs, and put under guard of the local fire brigade. At midnight the gale suddenly increased to a cyclone and the machines, notwithstanding the efforts of the guards were picked up and carried several hundred feet into the air. When they fell their destruction was complete. A third machine anchored near the other two was not disturbed.

## RUSSIA

German aeroplanes have lately been bombarding Riga and the district north of Kreitzburg. North of Dwinsk two Zeppelins were observed flying over Mishtel.

## MESOPOTAMIA.

The general officer commanding the troops in Mesopotamia says that on February 17th and 19th bombs were dropped by hostile aeroplanes on the British camp, but no damage was done.



# REPORTS ON WIND TUNNEL EXPERIMENTS IN AERODYNAMICS

## I. The Wind Tunnel of the Massachusetts Institute of Technology

By J. C. HUNSAKER

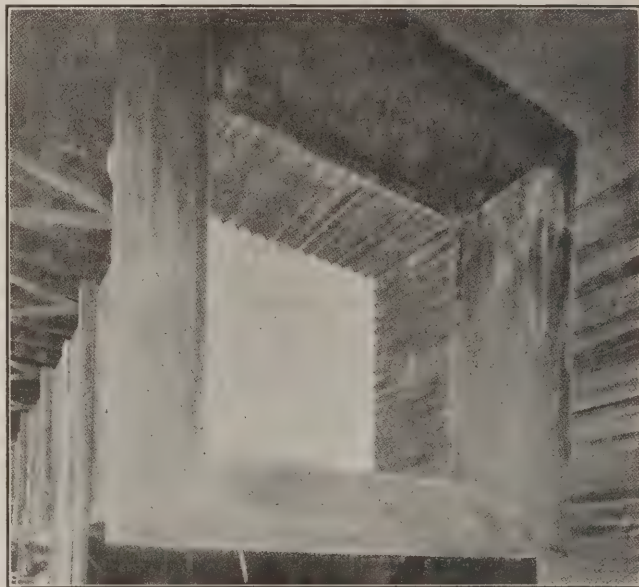
ASSISTANT NAVAL CONSTRUCTOR, U. S. NAVY  
INSTRUCTOR IN AERONAUTICS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

An aeroplane or airship in flight has six degrees of freedom, three of translation and three of rotation, and any study of its behavior must be based on the determination of three forces—vertical, transverse, and longitudinal—as well as couples about the three axes in space. Full scale experiments to investigate the aerodynamical characteristics of a proposed design naturally become mechanically difficult to arrange. The experimental work is much simplified if tests be made on small models as in naval architecture, and a further simplification is made by holding the model stationary in an artificial current of air instead of towing the model at high speed through still air to simulate actual flying conditions.

The use of a wind tunnel depends on the assumption that it is immaterial whether the model be moved through still air or held stationary in a current of air of the same velocity. The principle of relative velocity is fundamental, and the experimental discrepancies between the results of tests conducted by the two methods may be ascribed on the one hand to the effect of the moving carriage on the flow of air about the model and to the effect of gusty air, and on the other hand to unsteadiness of flow in some wind tunnels.

The wind tunnel method requires primarily a current of air which is steady in velocity both in time and across a section of the tunnel. The production of a steady flow of air at high velocity is a delicate problem, and can only be obtained by a long process of experimentation. A study was made of the principal aerodynamical laboratories of Europe from which these conclusions were reached: (1) That the wind tunnel method permits a leisurely study of the forces and couples produced by the wind on a model; (2) that the staff of the National Physical Laboratory, Teddington, England, have developed a wind tunnel of remarkable steadiness of flow and an aerodynamical balance well adapted to measure with precision the forces and couples on a model in any position; and (3) that the result of model tests made at the above laboratory are applicable to full scale aircraft.

Consequently it was decided to reproduce in Boston the four-foot wind tunnel of the National Physical Laboratory, together with the aerodynamical balance and instruments for velocity measurement. Dr. R. T. Glazebrook, F. R. S., director of the National Physical Laboratory, most generously presented us with detail plans of the complete installation, including the patterns from which the aerodynamical balance was made. Due to this encouragement and assistance we have been able to set up an aerodynamical laboratory with confidence in obtaining a steady flow of air of known velocity.



Entrance nozzle, showing end of honeycomb.

The time saved us by Dr. Glazebrook, which must have been spent in original development, is difficult to estimate.

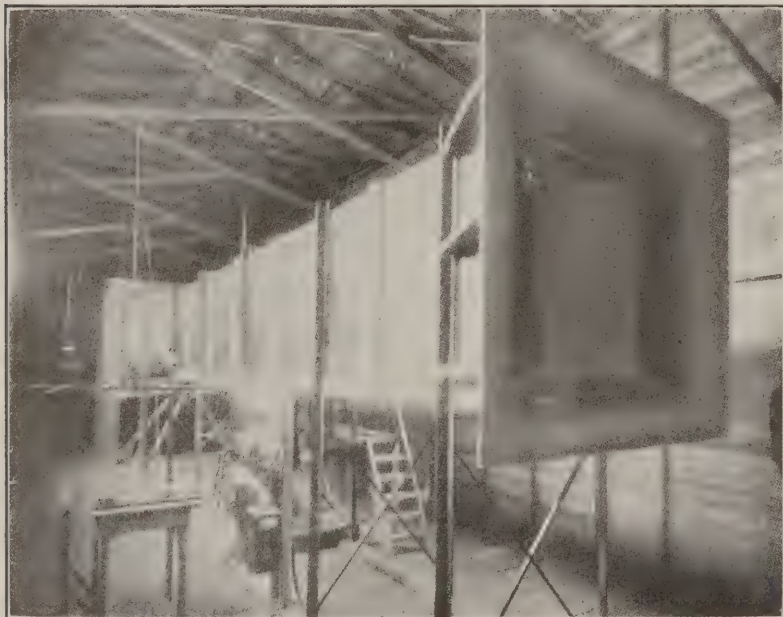
The staff of the National Physical Laboratory have developed several forms of wind tunnel in the past few years. In 1912-13 Mr. Bairstow and his assistants conducted an elaborate investigation into the steadiness of wind channels as affected by the design both of the channel and the building by which it is enclosed.<sup>1</sup> The conclusions reached may be summarized as follows:

- (1) The suction side of a fan is fairly free from turbulence.
- (2) A fan made by a low pitch four-bladed propeller gives a steadier flow than the ordinary propeller fan used in ventilation, and a much steadier flow than fans of the Sirocco or centrifugal type.<sup>2</sup>
- (3) A wind tunnel should be completely housed to avoid effect of outside wind gusts.
- (4) Air from the propeller should be discharged into a large perforated box or diffuser to damp out the turbulent wake, and return the air at low velocity to the room.
- (5) The room through which air is returned from the diffuser to the suction end of the tunnel should be at least twenty times the sectional area of the tunnel.
- (6) The room should be clear of large objects.

The wind tunnel of the Institute of Technology was built in accordance with the English plans, with the exception of several changes of an engineering nature introduced with a view to a more economical use of power and an increase of the maximum wind speed from 34 to 40 miles per hour.

Upon completion of the tunnel an investigation of the steadiness of flow and the precision of measurements was made in which it appeared that the equipment had lost none of its excellence in its reproduction in the United States.

As will be shown below, the current is steady both in time and across a cross-section within about 1 per cent in velocity. Measurements of velocity by means of the calibrated Pitot tube presented by the National Physical Laboratory are precise to one-half of 1 per cent. Force and couple measurements on the balance are precise to one-half of 1 per cent for ordinary magnitudes. Calculated co-efficients which involve several measurements of force, moment, velocity, angle, area and distance, as well as



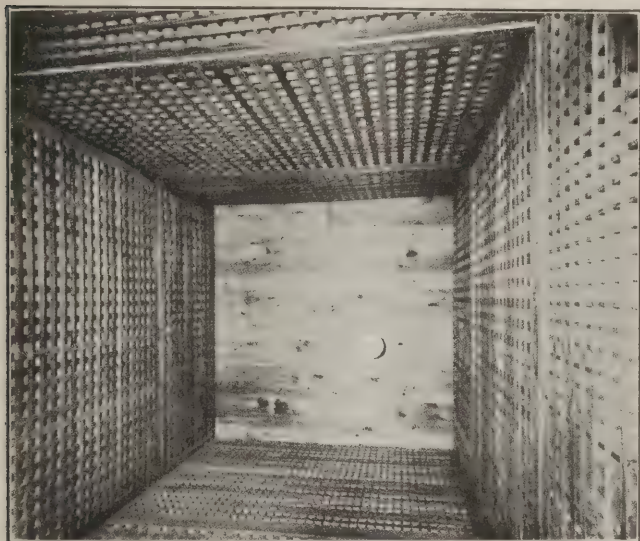
Suction end of wind tunnel.



one or more assumptions, can be considered as precise to within 2 per cent. It is believed that it is not practicable to increase the precision of the observations to such an extent that the possible cumulative error shall be materially less than the above.

#### DESCRIPTION OF WIND TUNNEL

A shed 20 by 25 by 66 feet houses the wind tunnel proper, 16 square feet in section, and some 53 feet in length (pl. 1). Air is drawn through an entrance nozzle and through the square tunnel by a four-bladed propeller, driven by a 10-h.p. motor. Models under test are mounted in the center of the



Interior of diffuser.

square trunk on the vertical arm of the balance to be described later.

The air entering the mouth passes through a honeycomb made up of a nest of 3-inch metal conduit pipes 2 feet 6 inches in length. This honeycomb has an important effect in straightening the flow and preventing swirl.

Passing through the square trunk and past the model, the air is drawn past a star-shaped longitudinal baffle into an expanding cone. In this the plans of the National Physical Laboratory were departed from by expanding in a length of 11 feet to a cylinder of 7 feet diameter. This cone expands to 6 feet in the English tunnel. M. Eiffel affirms that the working of a fan is much improved by expanding the suction pipe in such a manner as to reduce the velocity and so raise the static pressure of the air. Since the fan must discharge into the room, the pressure difference that the fan must maintain is thus reduced. Also with a larger fan the velocity of discharge is reduced, and the turbulence of the wake kept down.

The propeller works in a sheet metal cylinder, 7 feet in diameter, and discharges into the large perforated diffuser. The panels of the latter are gratings and may be interchanged fore and aft. The gratings are made of 1½-inch stock with holes 1½ by 1½ inches. Each hole is then a square nozzle one diameter long. The end of the diffuser is formed by a blank wall. The race from the propeller is stopped by this wall and the air forced out through the holes of the diffuser. Its velocity is then turned through 90 degrees. The area of the diffuser hole is several times the sectional area of the tunnel, and the holes are so distributed that the outflow of air is fairly uniform and of low velocity (pl. 2, fig. 1).

A four-bladed black walnut propeller (pl. 2, fig. 2) was

designed on the Drzewiecki system and has proved very satisfactory. In order to keep down turbulence a very low pitch with broad blades had to be used. To gain efficiency such blades must be made thin. It then became of considerable difficulty to insure proper strength for 900 r. p. m. as well as freedom from oscillation.

The blade sections were considered as model aeroplane wings and their effect integrated graphically over the blade. The blade was given an angle of incidence of 3 degrees to the relative wind at every point for 600 r. p. m. and 25 miles per hour. The pitch is thus variable radially.

To prevent torsional oscillations, the blade sections were arranged so that the centers of pressure all lie on a straight line, drawn radially on the face of the blade. This artifice seems to have prevented the howling at high speeds commonly found with thin blades. The propeller has a clearance of ½ inch in the metal cylinder.

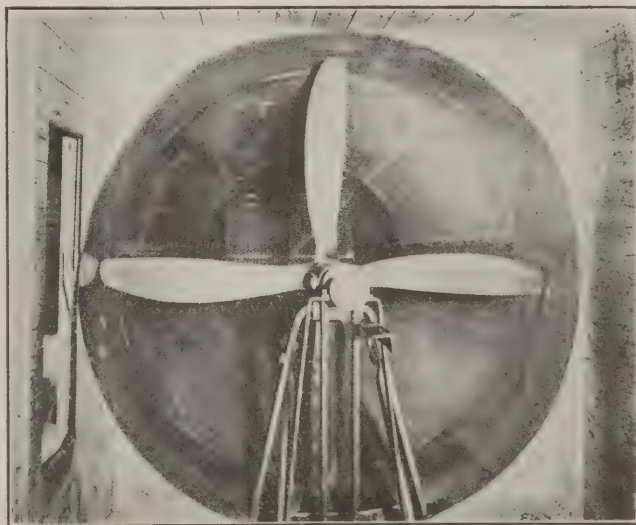
The propeller is driven by a "silent" chain from a 10-h.p. interpole motor beneath it. The propeller and motor are mounted on a bracket fixed to a concrete block and are independent of the alignment of the tunnel. Vibration of the motor and propeller cannot be transmitted to the tunnel, as there is no connection.

The English plans for power contemplate a steady, direct current voltage. Such is not available here. A 15-h.p. induction motor is connected to the mains of the Cambridge Electric Light Company. This motor then turns at a speed proportional to the frequency of the supply current for a given load. Fluctuations of voltage are without sensible effect, and the frequency may be taken as practically constant.

The induction motor is directly connected to a 12-h.p. direct-current generator, which is turned at constant speed and which generates, therefore, a constant direct current voltage for given load.

By change of the generator field rheostat and motor field rheostat the propeller speed can be regulated to hold any wind velocity from 4 to 40 miles per hour. The control is very sensitive. Left to itself, the speed of the wind in the tunnel will vary by 2 per cent in two or three minutes. This variation is so slow that by manipulation of the rheostats the flow can be kept constant within ½ per cent. The cause of the surging of the air is not understood, but is probably due to hunting of the governor of the prime mover in the Cambridge power house, causing changes in frequency too small to be apparent. The gustiness of outdoor winds seem to have no effect, although the building is not air-tight.

(To be continued)



Propeller of wind tunnel.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
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**PLATTSBURG MODEL AERO CLUB**  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

## The Cook 42 Hydroaeroplane

By ELLIS C. COOK

THE Cook 42, second prize winner in the National Model Aeroplane Competition for hydros and duration record holder for twin-screw hydros, is constructed along orthodox lines. Although designed in the winter of 1914-1915 it was not completed until just prior to the hydro competition. It is of the common "A" frame design with the 1-1-0-P 2 wing and propeller arrangement. The float system is of the familiar 0-2-1 system. The model is fairly light, weighing, when complete, 3.33 oz., of which 1.2 oz. is rubber motors.

**Frame and Chassis.** The frame is built up of two white pine strips  $38\frac{3}{4}$ " long and  $5\frac{1}{16}$ "  $\times$   $\frac{1}{8}$ " in cross section. They taper toward the ends where they are only  $\frac{1}{8}$ " and  $3\frac{1}{16}$ " high in the front and rear respectively. The strips are braced by three "X's" made of  $3\frac{1}{16}$ "  $\times$   $3\frac{3}{64}$ " bamboo streamlined. These prevent any bending tendencies in a sideward direction. The propeller bearings are small streamlined forgings of light weight. They are bound to the frame with thread and glued with a celluloid solution. The front hook is made of No. 16 piano wire bound to the frame. The chassis holding the floats is made of  $3\frac{1}{32}$ " bamboo bent to shape and bound to the frame. The floats are attached to the chassis by rubber bands, the angle of the front ones being adjustable.

**Wings.** The main wing has a span of 36 inches and chord of 5 inches. It is constructed of two white pine beams 30 inches long, with bamboo wing tips. The ribs, seven in number, are also bamboo and are spaced  $4\frac{1}{2}$  inches apart. The elevator, or front plane, has a span of 14 inches and chord of  $3\frac{3}{4}$  inches. The framework is made entirely of bamboo. The entering edge is given a slightly greater dihedral so that the angle of incidence at the tips is greater than at the center. In this manner the added incidence in the front plane is obtained. Both wings are fastened to the frame with rubber bands.

**Floats.** The two front floats are spaced eight inches apart and are of the stepped type. The step is  $3\frac{1}{2}$  inches from the front and is  $\frac{1}{8}$  inch deep. The two floats are separated by two bamboo strips which are tied to the rounded portion of the under-carriage by small rubber bands. By sliding these strips back and forth the angle of the floats may be altered to suit conditions. The floats are built up with two thin pieces of white pine for sides, separated by small pieces of wood about one-half the size of a match in cross section. They, as are also the wings, are covered with a chiffon veiling proofed with a special preparation. This makes a water-tight and strong construction without any undue weight.

**Power Plant.** The two ten-inch propellers with which the model is fitted have a theoretical pitch of twelve and one-half inches. They are carved from blanks  $\frac{1}{2}$  inch thick and have blades having a maximum width of one inch at a radius of three inches. The shafts are made of No. 16 piano wire and have small washers for bearings. Each propeller is driven by three strands of  $\frac{1}{4}$ -inch strip elastic. The rubber is given 1700-1750 winds, and turns the propellers at 1150-1200 r.p.m. when in flight. When not in flight the r.p.m. is considerably less, about 750.

The model seems, when in flight, to be slightly overpowered, although this is not the case. It takes but two or three feet of run to leave the water, and climbs at a very steep angle to an altitude of about 125 ft. The motors unwind in 85-90 secs., the glide making up the rest of the duration. Its flights from a duration standpoint are very consistent. Out of its six timed flights, four have been between 98 and

100.6 secs., which is somewhat unusual for a model which makes good duration.

Any further particulars can be obtained from Ellis C. Cook, 6935 Stewart Ave., Chicago, Illinois.

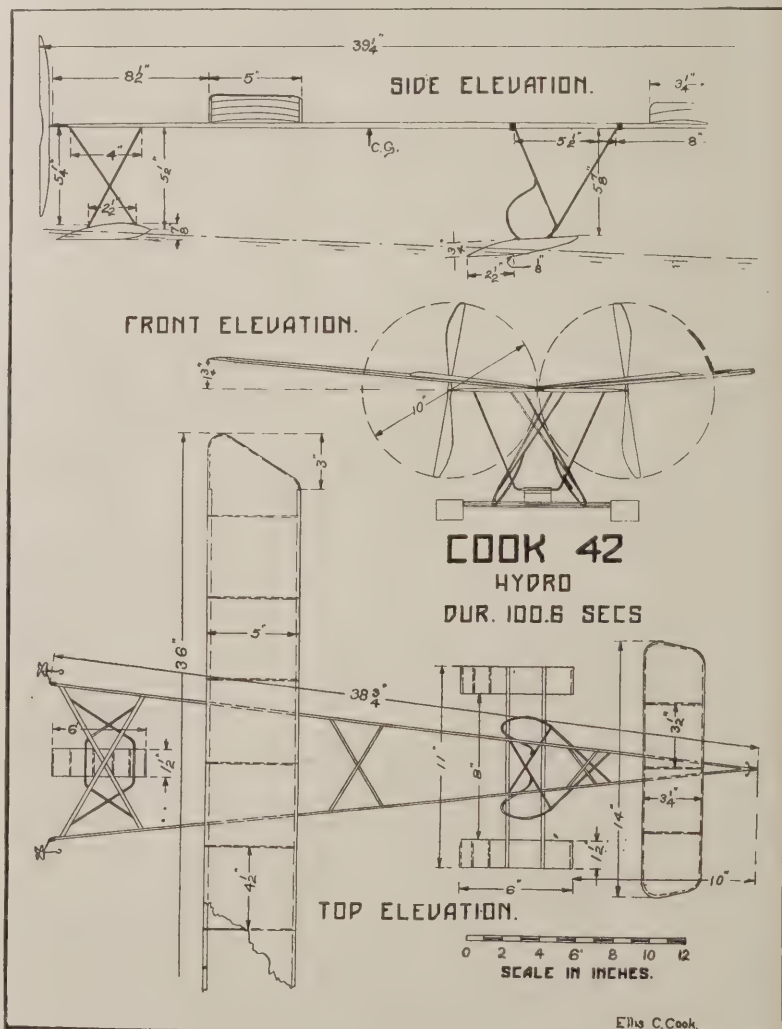
## The Illinois Model Aero Club

At the last meeting of the Illinois Model Aero Club, held under the auspices of the Social Activities Committee, lectures were delivered on power-driven models. Mr. Ellis Cook spoke on compressed air models and Mr. Harry Wells on gasoline power plants. The lectures were intended to give the members an opportunity to familiarize themselves with the principles involved in the construction of such engines.

This week the club will send models and exhibitors to Hyde Park and Lane Technical High Schools for the purpose of recruiting new members.

## Aero Science Club of America

On February 26th the Aero Science Club held a very interesting meeting. The most important subject of discussion was the coming National Model Aeroplane Competition. Mr. Schultz drew up suggestive rules for the governing of the competition in accordance with the request of the Aero Club, a copy of which was sent. Many members are designing and constructing models for this competition, which promises to add a very important chapter to the history of model flying. Secretary, 29 West 39th Street, New York City.



Ellis C. Cook.





**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### Necessity.

It will surprise nearly everyone to learn that in the United States last year 5,000 persons were killed while walking on railroad tracks.—Kansas City Star.

They had to walk somewhere. They had probably tried city streets and country roads and thought their chances were better on railroad tracks. But why not areoplanes?

#### At the Aviator's Hotel

Mrs. Stubbins—Do you like codfish balls, Mr. Fox?

The New Lodger—I don't know, Mrs. Stubbins. I never attended any.

First American Aviator—Just back from London?

Second American Aviator—Yes.

"What steamer were you rescued from?"

#### Health Hints.

To make an inexpensive light for a hangar, drop a match in a puddle of gasoline.

An aviator was ticketed to undergo a slight operation at the city hospital. Simple though the operation was, the man didn't feel quite easy about himself.

A few minutes before the anesthetic was to be applied, he sent for his physician, who was to handle the instruments.

"Please, doctor," he said, "be careful about me."

"Oh, don't worry," the doctor said with fine assurance. "You'll be all right."

"But I wish you to be careful, doctor," the patient insisted.

"You seem quite anxious about yourself," the doctor remarked with a smile.

"I am," the patient replied, nervously. "I have \$900 life insurance, and I don't like my wife."

#### Wasn't Covered.

H. H. Kohlsaas, the Chicago publisher, registered at the Hotel Cecil in London recently, and was assigned to a room on next to the top floor. The following morning he rang for a bell-boy. When there was no response to the second call he lifted the telephone receiver and waited in vain for "Are you there?" Failing to establish any communication with the office, he dressed and started for the office to register indignation. The elevator wasn't running. He began to walk down. On the fourth landing he met a housemaid and asked in strong Chicago language what was the matter with the hotel.

"Well, sir, you see, sir," came the answer; "the Zeppelins were reported, and we were all ordered to the cellar for safety."

"—!" After which Mr. Kohlsaas said, "Well, I'm on the next to the top floor, and I wasn't warned."

"No, sir," was the bland reply, "but you see, sir, you don't come under the Employers' Liability Act, sir."

#### Very Promising.

The aviator and his fiancée had just become engaged.

"What joy it will be," she exclaimed, "for me to share all your griefs and sorrows!"

"But, darling," he protested, "I have none."

"Perhaps not now," she answered, "but when we are married you will have."

#### Something Anyway.

"So you think a college education is a good thing for a boy?" said the aeromotor salesman to his friend.

"Yes, I think it's a pretty good thing. Fits him for something in life. If he can't catch on with a baseball team, he can often land a job as a professor."

#### A Slow Starter.

The employee of a large aeroplane factory was recently taken to task by the boss for oversleeping. After due reflection the employee replied: "Well, sor, it's this way: I sleep very slow, and so it takes me a long while to git me night's rest."

He—The artists say that 5 feet 4 inches is the divine height for women.

His Darling (crossly)—You know I am 5 feet 8 inches.

He (quickly)—You are more than divine, my dear.

"It's the regret of her life that she has never been able to afford a trip aloft."

"Wants to see the world, does she?"

"It isn't that. But she has a remedy for mountain sickness that she is simply crazy to try."

#### Overheard on the Aviation Field.

Cedric—Well, old chap, what are you doing heah?

Clarence—Just admiring the beauties of nature.

Cedric—Aw, I say, have many gone by?

#### A Big Difference

"I thought old man Dicks, the aeroplane builder, left all of his money to charity."

"Oh, no—to charitable institutions."



—Courtesy Life.

#### WAR NEWS.

"Yesterday an armored aeroplane passed over the vicinity of Limburg."



# MILITARY *Curtiss* TRACTOR

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BUILT FOR SPEED  
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CURTISS 160 H. P. MOTOR

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No. 26

## The Aeronautical Needs of the Army, Navy and Militia

**A**N open letter outlining the aeronautical needs of the Army, Navy and Militia has been sent by Henry Woodhouse, Governor of the Aero Club of America, to every Congressman and Senator.

The letter in part follows:

"There is an important question for you to decide: whether you want the United States to be with the first and second class powers, or with their colonies.

"Our first line of defense should have 2,000 aeroplanes; it has twenty! This includes all the training machines and represents the maximum number of aeroplanes that have been in commission at any one time in the Army and Navy during the past twelve months. The official reports show that the average number of aeroplanes in commission in the Army each month during the year 1915 was only seven machines. The official average for the Navy is not given, but it is known that there seldom have been ten machines in commission, including the training machines, although there were over twenty officers to use them.

"There never has been a time when the Army and Navy have had an aeroplane for each officer—pilot—which is absolutely necessary to make the air service available for service as well as to safeguard the lives of the officers who fly. To have more than one man fly a machine is both wasteful and dangerous. It keeps a highly paid officer waiting for his turn to fly—and when his turn comes he does not know the condition of the machine and runs the risk of accident. European nations allow three aeroplanes to each pilot.

"Nor has it yet been possible to give the Army and Navy dirigibles, captive balloons, kites, aircraft, guns and other equipment which is absolutely necessary to the military aeronautic organization.

"As the funds for aeronautics for the Army and Navy are now exhausted, and the twenty or so aeroplanes ordered will be needed to replace worn out machines, conditions cannot improve until the new appropriations become available on June 30th.

### Will Conditions Be Improved? Published Estimates Do Not Indicate It

"The published estimates of the War and Navy Departments for the year beginning June 30th provide for the acquisition of less than two hundred aeroplanes. No estimate has been made for aeroplanes for the Militia. Nor is there, except by cutting down the number of aeroplanes, any provision for giving the Army and Navy dirigibles, observation balloons, kites, aircraft guns and other equipment necessary to form an efficient aeronautic organization.

### Congress's Obsession Responsible for Deplorable Conditions in Military Aeronautics

"There also still seems to prevail the obsession that aeroplanes are fixtures which will last for a long time. This obsession and the failure to recognize the fact that aeroplanes come in the class of 'consumables' needing continuous

replacing is mainly responsible for the very deplorable condition of aeronautics in the Army and Navy to-day. Not recognizing this fact there have not been allowed sufficient appropriations from year to year to permit replacing *aeroplanes* as often as necessary.

"So long as this obsession lasts there will be dead officers, and what in other countries is called the 'air service' will remain here a continuous struggle to attempt to train new officers in aviation to take the place of those who have been killed, hurt or have left the aviation branch of the service.

"At a time when European countries use aircraft by the thousands for offense and defense, and it is stated by the British Admiralty that control of the sea is of no avail unless there is added the control of the air, Congress is considering plans which would not even provide sufficient equipment for scouting purposes!

### Aeronautics Least Expensive and Most Efficient Branch of Service

"There is no excuse for failing to provide the Army, Navy and Militia with sufficient aeronautical equipment.

"When the problems of immediately improving the national defenses are considered, there is found that aeronautics affords possibilities of quick developments and immediate relief at only a fraction of the cost of developing other arms. Richard Harding Davis, the famous war correspondent, has said: 'Of all the weapons produced by this war the aeroplane is the most efficient. It protects, it destroys, it fights. It is the super spy, super scout, super belligerent.'

"With five thousand trained aviators this country would be in the safe position of the porcupine, which spends its days in peaceful pursuits, harming no one, but is ever ready to defend itself.

"The United States Navy, which has been said to be ahead of the French Navy, has less than twenty aeroplanes in commission and ordered, and only a small training dirigible ordered. The French Navy has over 2,000 aeroplanes and not less than twenty dirigibles. I submit that this shortage of aeronautic equipment makes the United States Navy fifth.

"If the submarine is the most dangerous enemy of the dreadnought and commerce, and the aeroplane is the most effective enemy of the submarine, does it not follow that without aeroplanes our dreadnoughts, which cost hundreds of millions of dollars, and our commerce, which is the very blood of our economic whole, are utterly unprotected?

"If an up-to-date aeroplane costing at most \$25,000 can, by going at a speed three times greater than the speed of a cruiser, displace three cruisers in coast patrol and submarine hunting, doing with \$25,000 and two men what is now done with \$6,000,000 and two thousand men, is there excuse for not having such aeroplanes?

"If one aeroplane costing but \$10,000 can save an \$18,000,000 battleship from destruction by a \$7,500 torpedo, what's the answer?

"There is no excuse for having less than twenty aeroplanes in commission in the Army and Navy when there should be two thousand. *Seeing that it took seven years for the Army and five years for the Navy to accumulate ten aeroplanes each, it is evident that at this rate it would take the best part of one*

**America Must be Given a Navy Equal to the Best.** If the first line of defense of all first-class powers have between one thousand and two thousand aeroplanes available, it is evident that the present naval program which provides only seventy-five aeroplanes for our first line of defense does not aim to make our Navy equal to the best, but makes the Navy tenth among the world's navies.



thousand years to secure the 2,000 aeroplanes which we ought to have to-day.

#### Plans Being Considered Would Class United States with European Powers' Colonies

"The estimates for aeronautics for the Army and Navy made public would leave the United States with the European powers' colonies where it has been for the past three years.

"This country can be made fifth in aeronautical equipment by spending \$25,000,000—England, Germany, France and Russia remaining at the head; or seventh, behind Austria and Italy, by cutting the allowance down to \$17,500,000, and the Netherlands by allowing only \$10,000,000. Lastly, it can be left where it is, behind the least of the other countries' colonies, by allowing less than \$10,000,000.

"Which do you want?"

#### Distribution of National Aeroplane Fund

THE National Aeroplane Fund in the past month has done some very concrete work towards extending the movement to organize aviation sections to all of the forty-eight States and launching the movement to train 5,000 aviators.

The Aero Club of America has sent checks from the National Aeroplane Fund to the following:

Godfrey L. Cabot, Pres. Aero Club of New England, a check for \$201.50, representing 10 per cent. of the funds raised by the Aero Club of New England prior to midnight, January 31, 1916.

Brig. Gen. Chas. H. Cole, Adj. Gen. of Mass., a check for \$500, Mr. T. Jefferson Coolidge's contribution to train an officer to pilot a military aeroplane; a check for \$70, the contributions of Mr. J. W. Elliott (\$50) and Mr. Roger F. Hooke (\$20).

Charles A. Johnson, Pres. Aero Club of Colorado, a check for \$300, representing 10 per cent. of the funds raised by the Aero Club of Colorado prior to midnight, January 31, 1916.

Brig. Gen. John Chase, Adjutant Gen. of Colorado, a check for \$5, representing the contribution of Mr. Wm. Thayer Tutt and brother.

Brig. Gen. W. W. Sale, Adj. Gen. of Virginia, a check for \$500, representing 10 per cent. of funds raised by a special campaign prior to midnight, January 31, 1916.

Brig. Gen. W. W. Sale, Adj. Gen. of Virginia, a check for \$100, the contribution of Mrs. John W. Harrison.

Portland Chamber of Commerce, of Portland, Me., a check for \$910, representing 10 per cent. of funds raised by the Portland Chamber of Commerce prior to midnight, January 31, 1916, for the development of aviation in the Militia and the establishment of the first station of the Aero Coast Patrol System.

Mr. Vincent Astor, Treasurer, a check for \$800, representing 10 per cent. of funds raised by Mr. Astor's Committee prior to midnight, January 31, for purchase of a seaplane for 2d Battalion, Naval Militia, N. Y.

Mr. Langdon B. Wood, a check for \$455, representing 10 per cent. of funds raised by Buffalo Aero Club prior to midnight, January 31, 1916.

Major William L. Hallahan, Chief Signal Officer, N. Y. N. G., a check for \$500, being a contribution of Mr. T. Jefferson Coolidge to train an officer to pilot a military aeroplane; a check for \$100, the contribution of Mr. H. N. Kip.

Mr. A. B. Lambert, Pres. Missouri Aeronautical Society, a check for \$260, representing 10 per cent. of funds raised by the Missouri Aero Society prior to midnight, January 31, 1916.

Col. C. W. Thomas, Jr., Adj. Gen. of California, a check for \$750, representing 10 per cent. of the cost of the hydroaeroplane presented to the California Militia by Glenn L. Martin; also check for \$1,200 for general expenses of starting an aviation section.

Aero Club of Michigan, a check for \$1,180, representing 10 per cent. of funds raised by Aero Club of Michigan prior to midnight, January 31, 1916.

Brig. Gen. B. W. Hough, Adj. Gen. of Ohio, a check for \$150, contributions received from Thomas A. Edison (\$100) and Le Grand Parish (\$50).

Brig. Gen. C. W. Abbott, Jr., Adj. Gen. of Rhode Island, a check for \$125, contributions received from Mr. F. E. Richmond 2d (\$100) and Earle Kimball (\$25).

Brig. Gen. T. J. Stewart, Adj. Gen. of Pennsylvania, a check for \$100, the contribution of F. S. Pleasanton.

Brig. Gen. J. Van Holt Nash, Adj. Gen. of Georgia, a check for \$13, contributions from Ed. S. Stoddard (\$3) and C. A. Cothran (\$10).

Brig. Gen. Geo. M. Cole, Adj. Gen. of Connecticut, a check for \$20, the contribution of Mr. Geo. C. Beach.

Brig. Gen. F. L. Bridges, Adj. Gen. of Indiana, a check for \$10, contribution of Mr. Carleton B. McCulloch.

The following funds have been placed on special deposit, pending the sending of Militia officers to the aviation schools for training:

Ten per cent. on \$19,200, which is the value of a course of training for one Militia Officer from each of the 48 States, such training being the gift of the Curtiss Aeroplane Company to the National Aeroplane Fund.

Ten per cent. of \$19,200, which is the value of a course of training for one Militia Officer from each of the 48 States, such training being the gift of the Grinnell Aeroplane Company to the National Aeroplane Fund.

Ten thousand dollars, which represents 10 per cent. of \$100,000, underwritten by the Cochrane Syndicate, of Chicago, Ill., is being held on special deposit for use in connection with the work of the Cochrane Syndicate in training aviators for National Defense.

#### Valuable Military Idea.

[Editorial in *St. Louis Globe Democrat*.]

THE Aero Club of America, an intelligently energetic organization of great promise, has just recommended plans to develop interest in aviation throughout the country as the best and cheapest way to promote the defensive resources of the country. In the present war the mechanical efficiency of flying machines has been demonstrated, though the most effective uses of them have not been made. Their most telling offensive work would be against army lines of supply and exposed military points in the rear, and they might derange an enemy's entire campaign by the mischief they could do in this regard. Dropping bombs on noncombatants is not war, nor a means by which a war could be decided. Probably 400 noncombatant men, women and children have been killed by explosives in the hands of aviators, but without any real advantage to the assailants. Mere atrocity is never good strategy. No doubt it was thought that large masses of citizens could be completely terrorized by bombs from overhead, and that general consternation would create a demand for peace at any price. No such spirit of despair has been aroused. On the contrary, the slaughter of people not in the service has stimulated recruiting in the communities that suffered most, as well as in their country at large.

It is seldom that as many as twenty aeroplanes have made a concerted attack in Europe. The machines in large numbers are not available. England appears to have few, and to be in some degree helpless against aerial attack. But thousands of aeroplanes in readiness would not be excessive in cost. They could serve the purposes of raiding cavalry, and it is a matter of history that the raids of mounted men added immensely to the difficulties of the Union armies in the Civil War. The raiders struck at lines of communication chiefly. Horses were harder to obtain now than then. Flying machines will fill the gap, and their number must be largely increased. The Aero Club of America grasps the situation, and favors the providing of many machines and the training of many men to operate them.

No vast sum is needed to expand our aviation service, nor to improve the national guard, nor to multiply the best submarines. The Aero Club mentions the question of cheapness in forms of preparedness, and it is one to be kept in mind.

#### Aeroplane Mail Carriers for Alaska.

[Editorial in *San Francisco Call*.]

THE possibility of an aeroplane mail service in Alaska is today a commonplace of the news.

California has an unofficial aeroplane mail delivery in San Luis Obispo County, and the system has worked well. Other localities have also such mail service, but the Postoffice Department at Washington has not yet provided officially for the air carriers.

With the introduction of an aeroplane mail service in Alaska, the next step will be the inauguration there of a passenger service. The mail man of the air will become the stage man of the air. The huskies can still draw freight on their long sleds, but the Alaska miner, with his belts bulging with gold dust, on a rapid trip to San Francisco to see the sights, will prefer the air route, and the aerial mail man will not refuse a passenger willing to pay his way in gold dust.

Aviators have predicted that after the war the aeroplane will become a common utility. The flying machine has been developed immensely in strength and size and efficiency on the battle front, where it has been the roving eye of the general staff. The utility of the machine, as perfected by war, will be employed in peace, and passenger-carrying machines will be common.

The United States Postoffice Department will have to hurry if it intends to be the first agency to employ the aeroplane in the everyday work of peace.



# THE NEWS OF THE WEEK

## Burgess Seaplanes Pass Navy Tests At Pensacola

W. Starling Burgess, president of the Burgess Company, of Marblehead, who has just returned from the Navy Aeronautical Training Station at Pensacola, where he was supervising the official tests of the Burgess-Dunne war seaplane, reports great activity among the Navy flyers. The performances of the Dunne, flown by Clifford L. Webster, of the Burgess squad of aviators, gave thorough satisfaction to the Naval authorities, although the tests were greatly hampered by the failure of the motor to work properly.

Aviator Walter E. Johnson, of the Curtiss Aeroplane and Motor Company, has been at Marblehead during the past two weeks engaged in testing the new Burgess school machine, especially built for the Navy. Although the weather has been very unsuitable for aero-marine work, a number of flights have been made. The controls of this machine are of the Deperdussin type, with a foot bar for the ailerons and a wheel on a column for the vertical and horizontal rudders, respectively.

This class of six hydro-aeroplanes was completed early during the present month, and shipments were to begin the moment the builders were satisfied that the type was thoroughly satisfactory in every respect, this being particularly important in the case of training machines, to be used by men not greatly experienced in the operation of flying craft.

Lieutenant G. D. Murray, U. S. N., is at Marblehead, inspecting the work of the Navy aeroplanes for the Navy Department, together with Chief Mechanician F. B. Conway, U. S. N. Every part of every Navy machine has been examined and stamped during the course of construction.

## Aeroplanes for Coast Guards

Assistant Secretary of the Treasury Byron R. Newton and Commander E. P. Bertholf of the Coast Guard are perfecting a plan for the organization of an aerial corps as an adjunct of the Coast Guard for saving life and property along the American Coast lines. It is proposed that expert aviators patrol the entire coast line. The aviators could not fail to see every ship apparently in need of assistance. Such vessels would be reported to the nearest Coast Guard cutter or life saving station. It is believed that by the use of powerful searchlights mounted on the planes, the patrol could be kept up at night.

## Montclair Will Purchase an Armored Aeroplane

Plans are under way which may result in the purchase by the Montclair Branch of the National Security League of an armored aeroplane which could be turned over to the government in case of war. On the suggestion of William B. Dickson of the Midvale Steel Company, President Robert M. Boyd, Jr., President of the Montclair Branch of the

National Security League has appointed a committee to consider plans for the purchase of this plane. This committee is composed of John C. Barclay, Henry C. Meyer, Jr., Louis K. Comstock and W. W. Knight. Mr. Barclay of the committee said that he considered the acquisition of aeroplanes one of the most important steps in national defense. A nation without sufficient aeroplanes and dirigibles and experts to operate them, he said, we can not expect to cope with any nation which has kept in the front rank of aeronautical exploitation.

Steps have also been taken by the League to effect the formation of a rifle club among the older boys in the Montclair High School.

## Americans in the French Aero Service

Paul Palveka of Madison Conn., who last December was transferred from the Foreign Legion of the French army to the army aviation corps has received his brevet as an army aviator. He is said to be the only American to have received a bayonet wound in the war. On Hill 119 which the Foreign Legion captured on June 16, 1915, a Bavarian defender stabbed him in the leg with a bayonet.

George Ames of Washington, D. C., and Robert Soubiran of New York also have been transferred from the Foreign Legion to the aviation service and are training at Pau. Other Americans training at Pau are Algernon Boysen of New York, Dudley Hill of Peekskill, N. Y., and James McConnell of Carthage, N. C.

## Building an Aerial Ambulance

Army aviators at San Diego Cal., have been permitted to see an aerial ambulance which a manufacturer in California is building.

"Slung underneath the body of the aeroplane," says a dispatch, "will be a small cot, so fastened and constructed that it will be impossible for the occupant to fall out or even be shaken when the aeroplane volplanes to earth. A hospital attendant will be enabled to give first aid while the craft is en route to the hospital."

## Curtiss Aviation School at Newport News, Va.

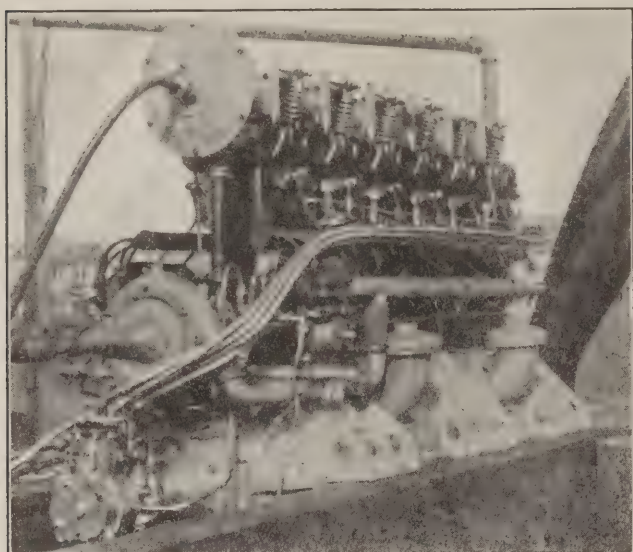
Victor Vernon and Steve McGordon have been added to the corps of instructors at the Curtiss Aviation School at Newport News, Va. The former operates a flying boat and the latter a land machine. There are now about 25 pupils studying aviation. It is no uncommon sight to see three tractors and two flying boats in the air at the same time. As the flying field is right on the edge of the water, races are frequent and add to the interest and the excitement of the corps.

The hangars are being enlarged to make room for additional machines that are expected in the near future.

The hangars and some of the flying boats and military tractors in use at the North Atlantic Aeronautic Station, Newport News, Va.







The Hall-Scott motor equipped with Christensen Self-Starter

#### Noted Carbureter Engineer Joins Master Carbureter Concern

Raymond M. Anderson, well-known carbureter engineer, has been appointed chief engineer of the Master Carbureter Corporation of Detroit. For five years Mr. Anderson was chief engineer of the Stromberg Motor Devices Co., Chicago, having much to do with the development of the carbureter of that name, and resigned from that concern to become research engineer for the J. I. Case Threshing Machine Co., Racine, Wis., maker of the Case automobiles. His experience has long been along the lines of better carburetion. It is realized by the Master concern, as well as other of the manufacturers of carbureters, that instruments must be continually experimented with in the effort to promote greater fuel economy. With gasoline soaring the problem of reducing the amount used falls upon the shoulders of the makers of carbureters as much or more than it does upon the designers of cars.

While the Master Company believes its instrument to be strikingly economical of fuel, the company has realized that no matter how efficient an instrument may be, there is always a chance for betterment, and, in line with this policy, the company selected Mr. Anderson from among a large number of engineers who were fitted for this work.

#### Aviator Arthur Smith Off for Japan.

Aviator Arthur Smith sailed from San Francisco on March 2d for Japan.

#### New Interest in the New Jersey Naval Reserve.

A new impetus was given to the already fine interest in the New Jersey Naval Reserve by the exhibit which it had at the Newark Automobile Show, held in the Armory of the First Regiment, Newark, N. J. Through the kindness of the management and that of the Aeromarine Plane & Motor Co. the courtesy of space was extended at the entrance to the Armory. The magnificent gift donated to the Naval Reserve by Inglis M. Uppercu in the shape of a 100 h.p. Aeromarine Tractor biplane, which has been fully described in other issues, was suspended from the ceiling in the center of the Armory and interested the many thousands who thronged the building during the show.

Officers and men from the Naval Reserve were on duty every afternoon and evening in dress uniform explaining the advantages of their branch of the service and enrolling acceptable applicants.

The aviation section of the New Jersey Naval Reserve will begin actual flying this month under conditions of the highest possible efficiency and from the caliber of men now enrolled and the few vacancies remaining excellent results are looked for from this branch of the unit.

#### New Aero School and Construction Company

The Interstate Aircraft Company and the Interstate Aviation School were organized recently, with headquarters at 110 West 40th street, for the purpose of giving practical instruction in aeroplaning and hydroplaning. The company also will build machines to specifications and engage in business incidental to the field it was organized to cover.

At the head of the new firm is an aviator of international reputation, Dijon de Waray. Associated with him are Alfred Croft and H. G. Witt, graduates of the Curtiss Aviation School. The former is in charge of the hydroaeroplane department and the latter in charge of the land school.

The instruction to be given in the new school differs from that given in other schools so far organized, because of the fact that scholars will specialize in military and mail carrying work, in both of which Col. de Waray has had considerable experience.

The technical course will be given at the school located at the above address and the practical work, including flights, will be given at West Haven, Conn., Bayshore, L. I., and Hempstead Plains, L. I., where grounds have been secured for the purpose.

Diplomas will be issued to such scholars only who make the tests prescribed by the License Board of the Aero Club of America.

It is further the purpose of the new company to build a dirigible of the Zeppelin type, to demonstrate the passenger carrying possibilities of such machine. It is planned to make a regular schedule between New York and Philadelphia, and Atlantic City.

The directors of the new company are: Dijon de Waray, President; Harry A. Bloomberg, Vice-President; Leon Mayer, Secretary and Treasurer.



One of the Dual Control Wright machines in use at the Wright Flying School, Augusta, Georgia. Instructor Gaines giving a student his first flight



### Machinists Strike at Buffalo.

In response to a strike called by the machinists union of Buffalo, about 200 of the 900 machinists employed in the Buffalo plant of the Curtiss Aeroplane Company quit their work recently. Five hundred of the 2,000 machinists at the Pierce-Arrow Automobile Company's plant also went out and several small concerns in other lines also temporarily lost employees because of the strike order.

### Aerial Passenger Route on Massachusetts Shore.

Hydroaeroplanes carrying four passengers will this summer make regular trips from the Lynn, Mass., bath houses, bordering on Nahant, to Gloucester Neck. Later the course may be extended to Magnolia and Manchester-by-the-Sea. Five minutes will be required to make the trip as originally planned and the fare will be a little over \$5 per passenger. The hydroaeroplanes used will be of the Burgess make.

### Looped-the-Loop in Jacksonville.

"Miss Jax," the aeroplane built in Jacksonville, Fla., by Bayesdorfer & Kuhl, has been tried out with satisfactory results. Aviator Kuhl recently made three flights over Pablo Beach and during one of them looped twice. The aeroplane is equipped with a Gnome motor.

### Rhode Island Aviation Corps Ball

Indicative of the interest taken by the members of the Rhode Island Aviation Corps, Rhode Island Naval Militia, was an "Aviation Ball," given in the Bristol Armory by the Corps. Over 700 persons were in attendance, including a delegation from Boston, which made the trip by a special train. A feature of the elaborate decoration was a model aeroplane swinging in midair.

This corps, which has been organized several months, includes among its members two licensed aviators and a number of experienced mechanics. Every branch of the division is made up of men who are proficient in their respective positions; and there are almost enough applicants on the waiting list to form a second section.

A class for instruction has been held at the Providence Armory every Friday evening during the winter, and at intermediate periods the corps has been drilled in the use of small arms, under the direction of Capt. Edward Gladding, R. I. N. G. The corps has been fortunate in being able to secure for its classes such speakers as Grover C. Loening of the Sturtevant Company, and Frank H. Russell of the Burgess Company. Three members of the corps are taking courses of instruction at one of the large aeroplane plants.



H. M. Harold, in his Wright machine, which he has secured for the exhibition season. He is now at Coronado, Cal.

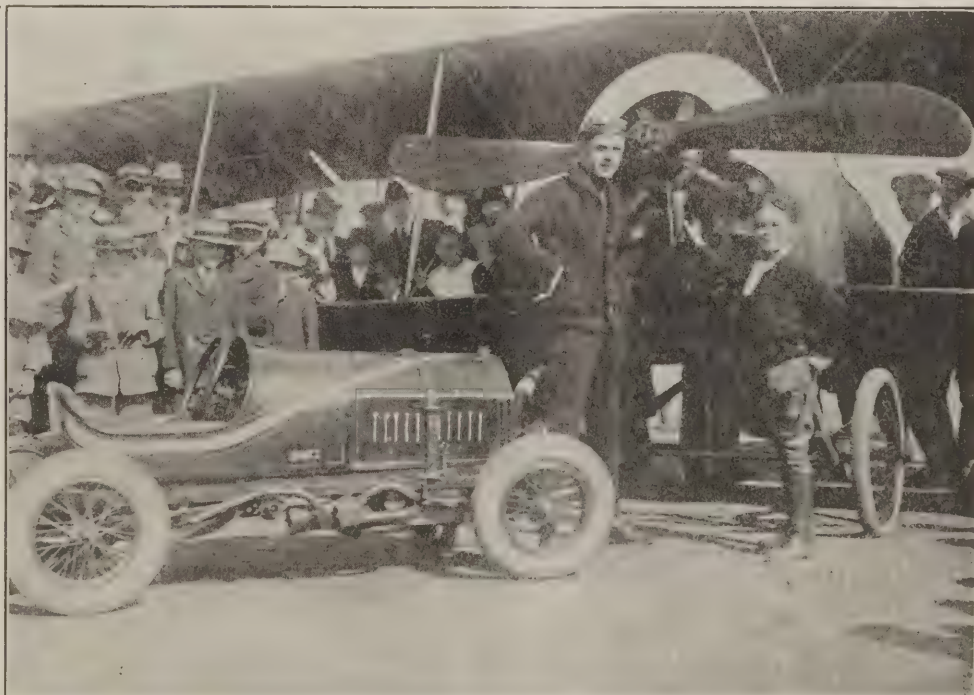
### Aeronautic Units within the Battle Fleet

Aeronautic units are to be developed within the United States fleet for the purpose of directing the fire of battleships at extreme ranges.

With hydroaeroplanes it is expected that effective fire can be maintained at a distance of 17,000 to 18,000 yards. Reports of Naval engagements in the North Sea indicate that there has been effective firing at 17,000 yards and in the spring target practice of the United States Navy it is thought that with the assistance of the hydroaeroplanes, by which the range can be corrected and the result of shots observed, interesting results may be obtained.

For the establishment of the aeronautic units referred to Capt. Mark L. Bristol, chief of the Navy Aeronautic Service, has been detailed to the command of the *North Carolina*, the ship that is equipped with apparatus by means of which hydroaeroplanes may be launched at sea. The *North Carolina* will join the fleet off Guantanamo and the hydroaeroplanes will be immediately placed in service.

Aviator Earl S. Daugherty, and Little "Bill" Meyer, who is learning to fly under Daugherty's tuition in a 50-H.P. Gnome motored Stupar tractor, made by the Chicago Aero Works





## NEW ALLOYS OF NON-FERROUS METALS

For the past year or more, the Garford Engineering Company, Elyria, Ohio, have been conducting experimental work and producing new metal alloys known as "Aero Metal." They have tried out this metal in a number of different fields, and claim that the results obtained have proven highly satisfactory for various uses. These alloys have been used to some extent in England, and the Garford Engineering Company is the first to produce them in this country.

Aero Metal consists of various light metal alloys, the combinations being changed to meet different physical requirements, and the most important factor in the production of these alloys is the process that permits the alloying of metals that under ordinary conditions cannot successfully be brought into a true alloy. Another factor is the combination of different metals in the proper proportions and by the use of the necessary alloying agents to secure desired results for different purposes.

Among the desirable qualities attributed to these alloys are their extraordinary strength, light weight, and in some cases hardness and in other toughness and, in fact, the various physical properties that can be secured in the different alloys through the patented process that makes possible the alloying of metals that have been impossible to alloy with the ordinary processes. Another special feature of some of the alloys is the non-corrosive properties, as certain alloys can be made to permit of a combination that is not readily affected by the different corrosive agents. It is also claimed that the processes permit of non-ferrous alloys being made with much greater uniformity than is possible in the ordinary methods used in making aluminum and copper base alloys.

The experimental work and practices of the Garford Engineering Company have been along the line of handling non-ferrous metals more scientifically than has been the ordinary practice, the company believing that this is a very broad field, and that progress will be made in handling these metals that will compare with the advance in producing steels during the past few years. This company is now furnishing Aero Metal in castings for replacing brass, bronze and iron, and is also furnishing large quantities of rods and sheets. The rods are being used quite extensively for making screws and other automatic screw machine products. The strength of the drawn rod is said to be equal to that of mild steel.

Considerable interest is now being shown by the automobile trade in Aero Metal alloys for general use, and especially for pistons as in the piston alloy, the specific gravity, strength

and frictional properties are said to be secured to such an extent that a large increase of power is possible as compared with the use of iron pistons.

This company has been carrying on extensive experiments in making die castings from the different alloys, including a number of high-melting point alloys with a view of producing castings approximately to finish, having exceptional strength and density. At the present time, Aero Metal alloy castings are made in molds both sand and iron, the practices to some extent being along usual lines except in the melting and handling of the metals.

Among the uses to which these alloys are now being put are the construction of automobile and marine engines, railroad and trolley car fittings, for various purposes on submarines and battleships, for cooking utensils, for general castings, also for equipment used in packing, dairy and chemical plants and for portable machine construction. It is claimed that these alloys can be used to advantage anywhere that a light, strong, metal is desired, and that they are particularly adapted for all kinds of fittings in replacing brass because of the high polish that can be given these alloys, which luster is retained on account of hardness and non-corrosive properties.

In automobile piston work, the advantage of reduced piston weight is generally known, and engines equipped with Aero Metal pistons have been in service for many thousand miles without the least sign of loose bearings and wear. The accumulation of carbon on the piston head is reduced on account of the cooling effect and high thermal conductivity of the alloys, and the ordinary poppet-valve motor equipped with aluminum pistons can be kept in service for a greater length of time before it is necessary to remove the carbon than if equipped with cast iron pistons.

This alloy in pistons wears excellently well with the usual lubrication. In fact, one set of pistons which has been under observation has shown a quarter of a thousandth wear after several thousand miles of average work. Naturally, the cylinder walls are less affected, as the alloy is not as hard as the cast iron.

The Garford Engineering Company are also about to produce what they claim to be a very fine bearing metal consisting of large percentages of copper and lead. It is stated that tests made with this bearing metal, especially in racing automobiles and for other bearings where there is a very severe wear, have proved the metal of exceptional value for use in all kinds of bearings.

## ERICSSON COMPANY GETS BIG FOREIGN CONTRACT

A contract for thousands of machines has just been placed with the Ericsson Manufacturing Company, of Buffalo, N. Y., for their Berling Magnetos by the F.I.A.T. Automobile Company, of Torino, Italy. The present requirements call for both Type "B" four-cylinder magnetos and N-44 Type four-cylinder magnetos.

This B-41, which constitutes a large part of the order, is of independent high-tension type. It is designed particularly for small motors up to 4-inch bore. Like the score or more different types of Berling Magnetos, this B-41 has the same virtues of versatility, rapidity of action, rigidity and accessibility of construction.

Probably the reason why the Berling was chosen by one of the greatest of European automobile manufacturers is that the Berlings have made such a wonderful record, not only in Italy, but elsewhere abroad, on the Curtiss aeroplanes. They have also proved their worth on the mammoth 200-h.p. 8-cylinder Sterling engines, which have been furnished to Italy for the 35-mile-an-hour motor boats recently adopted by the Italian army.

Another reason why the Italian automobile manufacturers have chosen the Berling is that the vast number of motor-cycles equipped with this kind of magneto have won an enviable record in every way.

From an engineering standpoint, the reason the F.I.A.T. chose the Berling is the high efficiency, due to the design of the magnetos, the careful selection of the materials used in their construction, and the balancing of the various parts, such as condensers, armature windings, magnets, etc., in their relations one to the other, to give the maximum output.

The reliability of Berling magnetos under the most severe service is assured by the thorough inspection of all materials entering into their construction. Only the highest quality

of magnet steel, which is subjected to a careful analysis and test, is used. The ball bearings are of the recognized highest quality; the platinum iridium contacts are the hardest and best the market affords. The use of such materials, combined with the accurate workmanship and the thorough supervision which follows every part through its various operations from the raw material to the finished product, and the running test to which each Berling magneto is subjected before receiving the approval of the final inspectors assures a high standard of reliability.

One of the features carefully worked out in the design of the Berling magnetos has been the accessibility of all parts which might require inspection or adjustment. This is shown by the easy method of removing the distributor for inspection or examination of the brushes. The interrupter, also, is easy of access, and so arranged that the contacts can easily be seen at those positions where it is necessary to observe the opening of the contact for adjustment.

The construction of the cam housing is such that the timing arm or lever may be placed on either the right or left side of the magneto by simply removing the entire cam housing and turning it 180 degrees.

The Berling magnetos develop a spark equally as strong in the retarded as in the advanced positions, thus easy starting and smooth running and power under varying conditions of speed are assured.

The quick, snappy action of the interrupter is the same at all speeds. The centrifugal force (instead of being a detriment) actually makes its operation more positive.

The cams which operate the interrupter are an integral part of the interrupter housing, and, therefore, cannot become loose. The interrupter can be inspected while the magneto is running, in order to ascertain if it is working properly.

In the Berling magnetos, the distributor and the collector brush holder are combined in one piece. The distributor is held in place by two springs, and may easily be removed for cleaning or inspection of the brushes by simply unsnapping these two springs.

A safety gap is provided between the center of the distributor and the frame of the magneto, in order to protect the insulation of the armature and other parts from injury due to excessive voltage. In case a high tension cable should become disconnected or the spark gap too great, the spark will jump across this safety gap and prevent injury to the magneto.





# FOREIGN NEWS

By JAMES E. CLARK



## BRAZIL

Although the aeronautic industry is in the constructive stage of its development in Brazil a monoplane has been built in the shops of the State Penitentiary at Porto Alegre.

## FRANCE

French airmen have been busy of late in efforts to counteract the work of the foe. One squadron of aeroplanes assailed the station at Chambley, southwest of Metz, dropping forty-four bombs. Forty bombs were dropped on the railway station at Bensdorf, to the eastward of Metz.

French aeroplanes likewise dropped forty shells on the railway station at Bensdorf and nine projectiles on the enemy establishments at Avricourt.

In Champagne a German aeroplane, shelled by French batteries in the vicinity of Suippes, fell in flames within the enemy lines.

Moving pictures taken from aeroplanes have come to be almost invaluable aids to the French commanders. Extensive use of the cinematograph is being made by the General Staff. The duty of the aviator and the cinematograph operator who are assigned to this work is exceedingly perilous. The duty calls for great daring, coolness, skill and the ability to run extreme risks without losing control of the machines. In bad weather they have to fly low in order to get good results and on such trips they are, of course, within range of the enemy. When these films are pieced together and shown on a screen in a dark room they reveal at a glance miles of the enemy's territory, hills, valleys, bridges and roads, the location of batteries, and what the hostile troops are doing. Here will be seen hundreds of men digging trenches; in another place the action of artillery; in another place the effect of gun fire, and sometimes there will be seen soldiers lying flat on the ground. In the latter instances they have learned that an aeroplane is hovering overhead and they are trying to escape observation. The films taken at sea are likewise complete, showing both ships and submarines, shoals, rocks and submerged sandbars.

The soldiers who shot down Zeppelin LZ-77 on February 20 have been complimented by President Poincare in person, who journeyed to Revigny, a town nine miles to the northwest of Bar-le-Duc, where the Zeppelin fell. The officer and men of the motor car on which was mounted the anti-aircraft gun which hit the Zeppelin and brought it flaming to earth, were presented with watches.

During the recent Zeppelin raids on Paris spectators described the searchlight employed on the Zeppelins as a piercing shaft that stopped the rays of the most powerful searchlights of the city. French scientists declare that this powerful light used by the Germans is a French invention known as "cold light," invented by a Frenchman, M. Dussand, who described it to the Academy of Science four years ago. The invention is said to realize an effective illuminating power equal to 90 per cent. of the initial energy, whereas, in the ordinary lighting systems, 80 to 90 per cent. of the energy is absorbed in heat. The invention was patented in all countries of the world. A Berlin concern bought the German rights in 1913.

## GREAT BRITAIN

The last great Zeppelin raid, prior to March 5, was made on January 31, when 57 persons were killed and 117 injured.

Three Zeppelins which made a raid on England on Sunday night, March 5, killed twelve persons and injured thirty-three. On arriving off the coast the three airships took different courses and wandered over eight counties. Though a total of about 40 bombs were dropped practically all of the damage was done in one Yorkshire town. The authorities declare that no military damage was inflicted. No soldiers were killed, no factories or railroads were damaged. There was an intermittent snowstorm during the raid but the airships did not appear to be troubled by the snow or the wind. In each case where they were observed the ships descended to comparatively low altitudes, and remained stationary for a time as if looking for a mark. The Zeppelin which visited the region of Kent dropped four bombs in a marshy field, and then disappeared in a great cloud of smoke which observers declared that it produced itself. A watcher who observed this Zeppelin through powerful glasses says there was a big rent in the envelope just behind the first car and that the torn fabric could be seen flapping in the wind. In support of the belief that this raider was struck, it is further stated that it drifted away broadside on. In at least four of the counties visited no bombs were dropped.

There have been presented to the British government a total of 53 aeroplanes by the various dominions of Great Britain since the outbreak of the war. The Overseas Club, the intermediary between the government and the dominions has just announced the presentation of twelve biplanes for the imperial flotilla. The list of the latest machines presented follows:

Pretoria—Seventy horsepower biplane from the people of Pretoria through Pretoria branch of the Overseas Club, \$7,500.

Ashanti—Seventy horsepower biplane from the Chief of Ashanti through crown agents for colonies, \$7,500.

Shanghai Race Club—Seventy horsepower biplane from the members of the Shanghai Race Club through H. H. Read, Shanghai; cost, \$7,500.

Accra—Seventy horsepower biplane from the residents of Accra through crown agents for colonies, \$7,500.

Akin-Abuakwa—Seventy horsepower biplane from the residents of Akin-Abuakwa division of the Gold Coast through crown agents for colonies, \$7,500.

Rhodesia—No. 3 70 horse-power biplane from the people of Rhodesia through British South Africa Company, \$7,500.

Poverty Bay, New Zealand—Henry Farman biplane from Poverty Bay district of New Zealand, \$10,195.

South Australia—One hundred horsepower Gnome-Vickers gun mounted biplane from people of South Australia through the Governor, Lieut.-Col. Sir H. L. Galway, \$11,250.

Nigeria—No. 2 70 horsepower biplane from the people of Nigeria through the Governor, Sir F. D. Lugard, \$7,500.

Lady Ho Tung, Hongkong—Seventy horsepower biplane from Lady Ho Tung, Hongkong, \$7,500.

Sir Robert Ho Tung, Hongkong—Seventy horsepower biplane from Sir Robert Ho Tung, Hongkong, \$7,500.

A German aeroplane appeared over the southeastern coast of England on the night of March 1 and dropped a number of bombs, one of which killed a baby. No military damage was done in the region over which the invader flew. On the following night the same aeroplane again appeared in the same district, but was pursued by two British airmen and was damaged in escaping. The next day a German seaplane, returning from a raid on England, was picked up by the French three miles north of the Middelkerke Bank, off the Belgian coast. It had fallen into the sea and one of the two occupants was drowned. The other was made a prisoner, and this is supposed to be the machine that the British airmen winged as it fled.

A letter received in London gives details of a fight between a Fokker and a British airman. While out on a reconnaissance the British pilot, with an observer, saw another British aeroplane being pursued by a Fokker. The latter was rapidly diminishing the distance between them. The pilot resolved to give battle to the Fokker and therefore shot his machine down almost vertically until he was slightly above and behind the Fokker. Then the observer fired twenty rounds at the German, but missed him. Next the two machines circled about, firing rapidly as they flew and finally the German tried to run away. The British aeroplane pursued.

"We were getting so low we expected the German 'Archies' to begin any moment," says the letter. "Then we got him. A lucky shot found its billet and the Fokker pilot was no more."

Twisting erratically the machine fell and plunged through the top of a dugout. The pilot and mechanic were killed instantly and four English soldiers in the dugout were injured.

## GERMANY

Berlin contends that on the occasion of the Zeppelin raid over England on the night of January 31 two government factories and two ammunition factories at Birmingham and one ammunition factory near Bradford were destroyed. A despatch says:

"At Birmingham two government factories and two ammunition factories were destroyed. One brewery was damaged at Eccleshill. Near Bradford one ammunition factory and three spinning mills were wrecked. At Partington one bomb destroyed twenty-two houses.

"On the Humber a battery was silenced, the cannon and searchlights being destroyed. At Grimsby and in the vicinity of Hull considerable damage was done, as was also the case at Sheffield.

"The cruiser Caroline and the destroyers Eden and Nith were sunk. The Caroline sank in six minutes, thirty-one members of the crew being killed, fifty-eight wounded and forty-seven drowned."

The bombardment of open towns in France and England by aircraft was sharply criticised, at a recent session, in the Parliament of the Duchy of Baden by the Progressive Deputy, Herr Hummel. A violent scene followed the Deputy's remarks. Herr Hummel declared that attacks on such towns on the pretext of reprisals were only the useless butchery of peaceful citizens. Deputy Kolb, Socialist, called attention to what he termed the brutal treatment of new recruits who are shortly to be sent to the trenches.

## GREECE

A German Taube was recently captured in Topsin, near Salonika, under dramatic circumstances. When the German was seen hovering overhead a French aeroplane chaser started in pursuit and gained on the Taube so rapidly that the invader was obliged to change his course. As he turned the Frenchmen fired as their adversary's side was exposed and one shot from the machine gun pierced the gasoline tank. The German was thus compelled to make a hasty descent. When the machine landed the two officers who were in it attempted to escape, but were halted by a Greek officer with a drawn revolver, who turned them over to the soldiers at the nearest guard house. The captured Taube was taken in triumph to Salonika, where it was placed on exhibition in the public square. Later, a detachment of troops was drawn up in front of it and in the presence of a great crowd the commanding general thanked the two French aviators who had brought down the Taube—Sergt. Terme and Quartermaster Sergeant Astor—and decorated them with the Cross of War.

## ITALY

Gabriele d'Annunzio, a lieutenant in the aerial corps, has been injured in the eye and is in a hospital. Lieut. d'Annunzio's fiery eloquence did much toward moving the Italian people to declare war on Austria. At the beginning of the war he sought to remain with the Italian fleet, but permission having been refused him, he entered the aeronautic service, became a lieutenant and on many occasions has flown behind the enemies' lines, dropping, besides bombs, proclamations and poems.

According to information received in Geneva, 800 Austrian soldiers were killed or wounded in the raid of February 19, made by Italian aeroplanes on the city of Laibach.

## TURKEY

A squadron of French aeroplanes at Salonika were taken on board the transports Detsarmauce, Ilot and Macronisse and afterwards bombarded the cantonments and defensive works of the Turks at Bournoba (Burnabad) and Borderio in the vicinity of Smyrna. The aviators traversed a distance of 350 miles while in the air.



AEROPLANE WINGS

By NEIL MAC COULL, M. E.

(Continued from page 573)

Referring to the curve for wing No. 33 in Fig. 2 the lift-drag ratio at the point where the lift coefficient is 0.00231 is 11.2. The drag is, therefore, 178.5 pounds, computed as before, and the power required is 19 h.p. By repeating this simple calculation for different speeds, points were obtained through which one of the curves of Fig. 6 was drawn.

But this computation is for a monoplane—correction for interference being necessary if a biplane is under consideration, and is made as follows. In the example just given the lift coefficient required for 40 m.p.h. was found to be 0.00231. Refer to Fig. 5 and find a point on the biplane curve where the lift coefficient is 0.00231, as at "A" if the gap of the biplane is to be equal to the chord. Find the lift coefficient on the monoplane curve, of a point directly above "A," as "B." This coefficient is now used in Fig. 2, where the lift-drag ratio of wing No. 33 is shown to be 8.9 for this lift coefficient. With this new lift-drag ratio the power is computed as before, the drag being found to be 225 pounds, and the power 24 h.p. The dotted curves of Figs. 6 and 7 show corrections made for biplane interference in this way. It must again be emphasized that such corrections are only approximate, but will serve the purpose until further experimental data are available.

It will be noticed that the angle of incidence has not been used in the calculations so far. There are only two instances where it is necessary to know this angle except when examining the movement of the center of pressure; one is in setting the wings on the body so that the latter will offer the least resistance when the aeroplane is flying at its greatest speed, and the other is when the landing gear and tail skid are being laid out, in order that the wings of the aeroplane when running on the ground will be able to meet the air at an angle at least as great as that representing the minimum speed. If the angle is less, the aeroplane cannot rise except at some speed greater than its natural minimum.

STRUCTURAL RESISTANCE

The drag of all parts taken together, except the wings, is considered as structural resistance, and varies as the square of the speed. The power required varies as the cube of the speed. Hence it is only necessary to calculate the resistance at one speed, such as 10 m.p.h., in order to plot a curve between speed and power. The accompanying table gives the resistance coefficients for parts making up the structural resistance, as completely as possible without going into the matter in more detail.

Table II

		K
Body of Deperdussin Monocoque (good stream-line shape) Without tail surfaces or landing gear.	Gnome engine partly exposed:	.00115
	Gnome engine enclosed:	.00086
Body only of usual Farman "pusher-type" aeroplane.		.00169
Curtiss model J-N tractor body, with tail surfaces and landing gear.		.0038
Struts: ratio of depth to width, from 3 to 5.		.00036
		.00044
Wire cables		.0029
Wheels (area taken as projected area of the tire)	Uncovered spokes	.0025
	Disk type	.0013

The resistance of any of these parts is found by multiplying the area of the maximum cross-section of the part, perpendicular to the wind, by the square of the velocity and by K, thus:

(Resistance, lbs.) = K × (Area, sq. ft.) × (m.p.h.)². (5)

The power is given by equation No. 3. For a biplane using the wings previously considered, the structural resistance was 43.8 pounds at 40 m.p.m., about 60 per cent. of the resistance resulting from the body and tail surfaces alone. This figure is fairly characteristic of biplanes weighing about 2,000 pounds, as now built, but will probably be considerably reduced as designs become more and more refined. For example, a streamline shape used for a dirigible has a coefficient of only 0.00012 which is about one-tenth that for the bodies now used. The importance of keeping the structural resistance as low as possible is shown by the rapid rise of the curve in Fig. 6, which follows the formula:

H.P. = (Resistance at 10 m.p.h.) × (m.p.h.)³ / 37,500. (6)

Besides giving the curve for the wing previously calculated, with its correction for biplane interference, Fig. 6 shows curves for two other wings for comparison, carrying the same load of 2,000 pounds. One is for wing No. 37, and of the same area; the other is for wing No. 33 as used in the calculations, except that it has an area of but 200 sq. ft. These curves show how great a variation in the characteristics of an aeroplane can be produced by an appropriate selection of the wing shape and its area.

Fig. 7 shows the total power required for wings and structural parts combined, being obtained from the curves of Fig. 6. The rapid increase of required horsepower as the speed is increased above 90-100 m.p.h. is noteworthy. In this figure is also shown the characteristic curve of the useful power delivered by a propeller. The maximum efficiency of about 81 per cent. is given at one speed

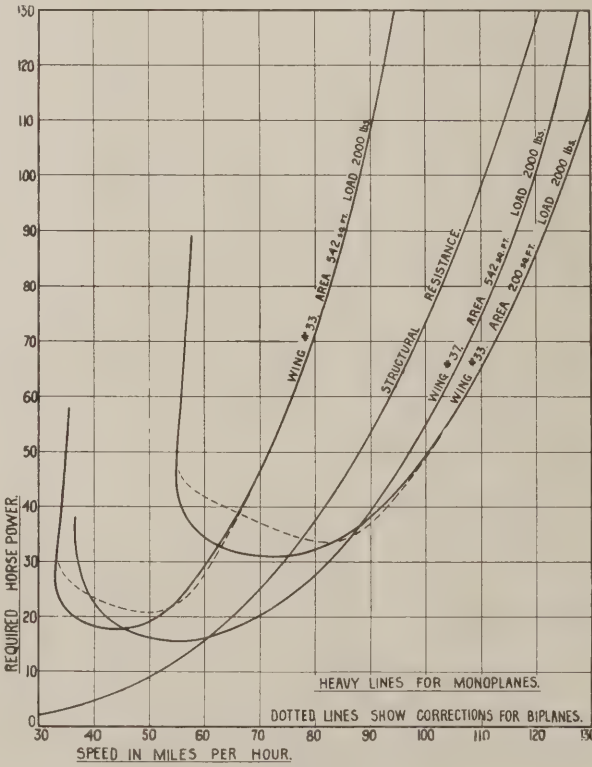


Fig. 6



only (this speed depending on the design of the propeller), and decreases at both higher and lower speeds, which accounts for the shape of this curve, though the engine delivers about 150 h.p. to the propeller at all speeds. The maximum speed for horizontal flight is given where this curve intersects with the curve of power required by the aeroplane. As the power is reduced by throttling the engine, the crest of the curve is lowered and the whole curve flattens out correspondingly. Thus it intersects the aeroplane curve at a lower point than before, showing that the maximum speed for horizontal flight will be less than before. When the power is so reduced that the propeller curve becomes tangent to the curve of required power, a speed is reached which is the minimum that can ordinarily be used. If the elevating controls are reversed at this point, so that climbing would result by *decreasing* the angle of incidence, a still lower speed could be maintained in horizontal flight by increasing the power, as can be seen in the figure. It is only by this means that it is possible to fly at an angle corresponding to the maximum lift coefficient.

CLIMB

When flying at speeds less than the maximum (as can be controlled by the elevator flaps), and with the engine delivering more power than is required for such speed, the excess power is expended in making the aeroplane climb. The actual climbing rate in feet per minute when the excess power is taken from these curves being given by the formula:

(Climbing speed) = 
$$\frac{(\text{Excess h.p.}) \times 33,000}{(\text{Total weight of aeroplane})} \dots (7)$$

This formula must not be used without due regard to the fact that as the aeroplane climbs it encounters steadily decreasing air density, which not only requires more power for flight, but decreases the engine power available,\* resulting in a steady reduction of the excess power. All of these curves have been based on the atmospheric pressure at sea level.

\*See "Loss of Engine Power at High Altitudes" by the writer, in Aerial Age Weekly, Nov. 22, 1915.

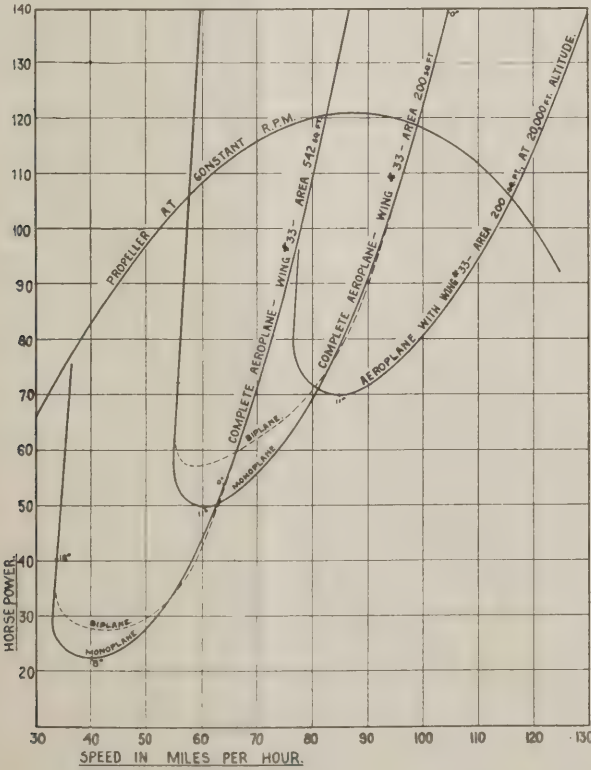


Fig. 7

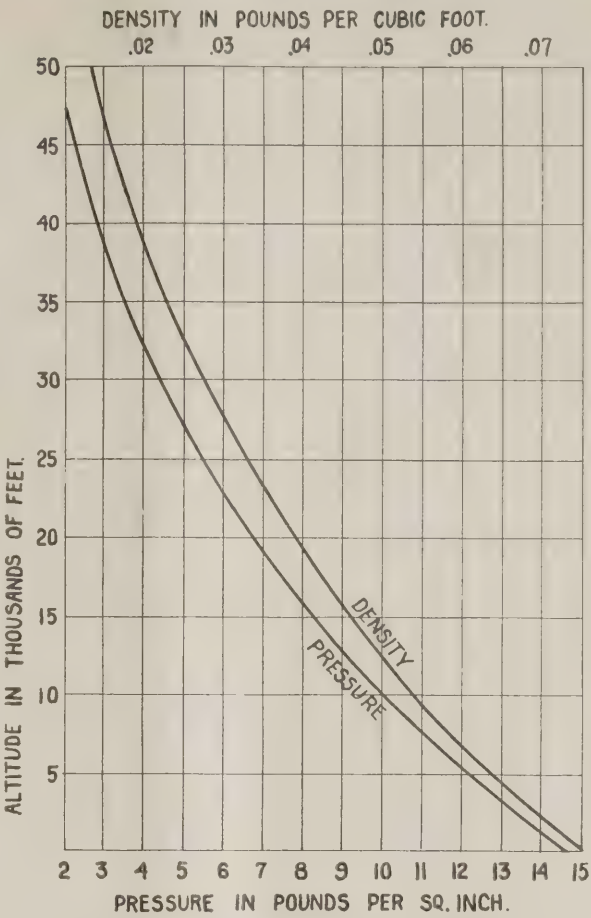


Fig. 8

EFFECT OF HIGH ALTITUDES

Both the lifting capacity of wings and the resistance of the air are directly proportional to the density of the air. Hence, at an altitude of about 20,000 feet, where the density is only half as great as at sea level, the lift coefficients will be only half as great, and the speed required to maintain the same weight as at sea level must be increased as shown by equation 8:

(Speed above sea-level) = 
$$\frac{0.276}{\sqrt{D}} \times (\text{Speed at sea-level}) \dots (8)$$

where "D" is the density of the air in pounds per cubic foot, taken from Fig. 8. At this speed the total drag of the aeroplane will be the same as before, but since the speed is greater, the power also will be greater, thus:

(H. P. above sea-level) = 
$$\frac{0.276}{\sqrt{D}} \times (\text{H.P. at sea-level}) \dots (9)$$

The curve for the aeroplane with the 200 sq. ft. wings has been plotted in Fig. 7 for an altitude of 20,000 ft. by taking points from the curve of this aeroplane at sea-level and multiplying both their speed and power by

$$\frac{0.276}{\sqrt{D}} = 1.4.$$

When it is considered that it is impossible for an engine at this altitude to deliver more than one-half its sea-level power, the restrictions to aeroplane altitude records can be appreciated.





# MODEL NEWS

Edited by G. A. Cavanagh and Harry Schultz



## CLUBS

**THE AERO SCIENCE CLUB OF AMERICA**  
29 West 39th Street, New York City  
**PACIFIC NORTHWEST MODEL AERO CLUB**  
9915 Ravenna Boulevard, Seattle, Wash.  
**LONG ISLAND MODEL AERO CLUB**  
401 Grant Avenue, Cypress Hills, L. I.  
**BAY RIDGE MODEL CLUB**  
6730 Ridge Boulevard, Bay Ridge, Brooklyn

**DETROIT AERO RESEARCH AND MODEL CLUB**  
c/o William P. Dean, 1717 Concord St., Detroit, Mich.  
**BUFFALO MODEL AERO CLUB**  
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**SPRINGFIELD MODEL AERO CLUB**  
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**MILWAUKEE MODEL AERO CLUB**  
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**CONCORD MODEL AERO CLUB**  
c/o Edward P. Warner, Concord, Mass.  
**PLATTSBURG MODEL AERO CLUB**  
c/o James Regan, Jr., Plattsburg Barracks, Plattsburg, N. Y.  
**MODEL AERO CLUB OF OXFORD**  
Oxford, Pa.

### The Cook 45 Riser

By ELLIS C. COOK

The Cook 45, American duration record holder for R. O. G. models, and second place winner in the National Model Aeroplane Competition for risers, is of the familiar "A" frame type. Its best results were obtained in the Milwaukee Model Aero Club—Illinois Model Aero Club dual meet on August 15, 1915, when it made a duration of 134.4 seconds and a distance of 1,698 feet. This duration was almost equaled in the eliminations for the National Competition, when it made 131 seconds.

**Frame and Chassis.** The frame is made of two white pine strips, 39" long and  $\frac{3}{8}$ " x  $\frac{1}{8}$ " in cross section, standing edge-wise. They are tapered toward each end, where the motor fittings are bound. The strips are braced by two "X's" and a straight piece of  $\frac{3}{16}$ " x  $\frac{3}{64}$ " bamboo streamlined. These strengthen the frame and prevent it from bending sideways. The propeller bearings are forged and are streamlined and light. They are glued and bound to the frame with silk thread. The front hook for the rubber is bent from No. 16 piano wire and is bound to the frame with thread. The chassis is also made of No. 16 piano wire bent to the shape shown in the drawing. The cork wheels have a diameter of  $1\frac{1}{4}$ " and are fitted with brass bushings.

**Wings.** The main wing has a span of 42" and a chord of 6". It is double surfaced with a light Japanese paper and treated. These two main beams are white pine  $\frac{1}{16}$ " x  $\frac{3}{2}$ " and is constructed entirely of bamboo and is only single surfaced. The tips have a 3-degree greater angle of incidence than the center. This method does away with any necessity for an elevating block. Both planes have a slight dihedral and are attached to the frame with rubber bands.

**Power Plant.** The propellers each have a diameter of 12" and a theoretical pitch of  $18\frac{1}{2}$ ". The shafts are of 16-gauge piano wire clinched into the propellers at the rear. Small copper washers are strung on the shafts to reduce friction. The rubber motors are each made of seven strands of  $\frac{3}{16}$ " wide strip elastic and are given 1300-1350 winds. The propellers revolve at about 700 r.p.m. when in the air. However, when not in flight, the r.p.m. is only about 450.

A run of 12 to 15 feet is required for the rise of the model. After climbing to a good altitude the model finishes up its flight with a rather flat glide. The weight of the model is made up of the following items:

Rubber .....	1.68 oz.
Frame and Props .....	1.30 oz.
Wings .....	.87 oz.
Chassis .....	.39 oz.

Total ..... 4.24 oz.

For any further particulars address Ellis C. Cook, 6935 Stewart Ave., Chicago, Illinois.

### The Aero Science Club of America

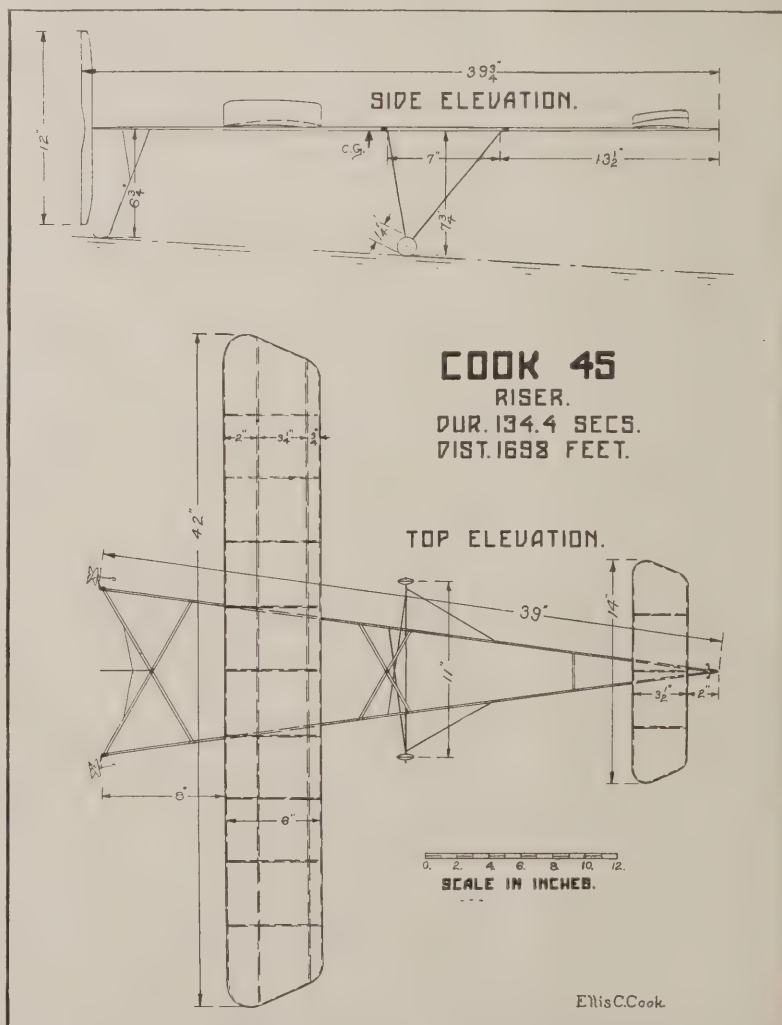
At the last meeting word was received from the Illinois Model Aero Club, a branch of the A. S. C., that many raw members were being enrolled in that club. Membership certificates will be sent to the names which were sent in from that club. A number of new members were also enrolled by the Aero Science Club during the past few weeks. The coming Model Aeroplane Competition was the main

topic of discussion. Many points of interest concerning compressed air motors, gasoline motors, and so forth, were freely discussed among the members. The Bay Ridge Model Aero Club has stated its intention of taking part in the coming competition. Secretary, 29 West 39th Street, New York City.

### Illinois Model Aero Club

By ARTHUR E. NEALY

Tuesday, the I. M. A. C. sent representatives to co-operate with Aviator Horace B. Wild in giving a demonstration and lecture to the students of the Hyde Park High School. The audience numbered over two thousand and was very successful both in regards to new members signed by the club and in the exhibition flights. The principle of the school first introduced Mr. Nealy, who appealed to the boys of the school in behalf of aviation in general and the Illinois Model Club in particular. Then the model fliers were introduced (Continued on page 625)







**Aeronitis** is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

#### 'Twas Heard in the Factory.

Casey—Now, phwat wud ye do in a case loike that?  
Clancy—Loike phwat?  
Casey—Th' walkin' diligate tills me to stroike an' me ould woman orders me to kape on wurrkin'.

#### Correct Diagnosis.

Air Pilot—Shall I have to give up beer, Doctor?  
Doctor—No, I sha'n't forbid it to you.  
Air Pilot—It's extraordinary, Doctor, what confidence I have in you.

#### Famous Messages of the Present War.

"We have met the enemy and they are ours—one passenger ship, two hundred women, fifty babies and two hundred unarmed men."

"I propose to fight it out on this line if we have to borrow all the money in America."

"Hold the Dardanelles, for I am not coming any further."

"Damn the Zeppelins! Go overhead."

"A little more gas, Captain von Bragg."

A sick aviator expressed a desire for some apple dumplings, and his wife made a dozen. A little son sat by the bedside watching the dumplings disappear one by one. After eleven had been devoured the boy said:

"Pa, can I have a dumpling?"

And the invalid, biting into the last of the toothsome delicacies, said:

"Go away, my son, don't worry your father; he is ill."

The proprietor of the aviators' hotel was approached by a gambler and requested to lend him \$10. Without saying a word, the proprietor punched the cash register, pulled out a five and handed it to the gambler.

"What?" said the latter. "Didn't I ask you for a ten-spot?"

The proprietor shifted his chew of tobacco over to the other side of his mouth, kicked his slippers in the corner and drawled in his characteristic fashion:

"We both lose five."

#### When Peace Comes.

It seems to Gerald Stanley Lee "that the prospect of peace has never been so bright in the history of man as it is today."

Not so much, however, because Henry Ford, William Bryan, Helen Keller and Jane Addams are opposed to war, as because Von Tirpitz, Count Zeppelin, Bernhardt and Houston Chamberlain are for it—because everybody is getting the notion that modern improvements have carried war beyond the limit of toleration.

Peace won't come till the war is over, but when it does come—Gerald thinks—it will settle right down on the world.

#### Effective, Too.

"There ought to be a law against aviation," said the humane citizen.

"There is one," replied the cold-blooded man. "The law of gravitation is continually interfering with it."

#### Anti-German.

"Do you think our aeroplane factories should be owned by the government?"

"I do! I'll even go further. I believe that our army and navy should be owned by the government."

The Thinker—I've got a letter from my son out West.

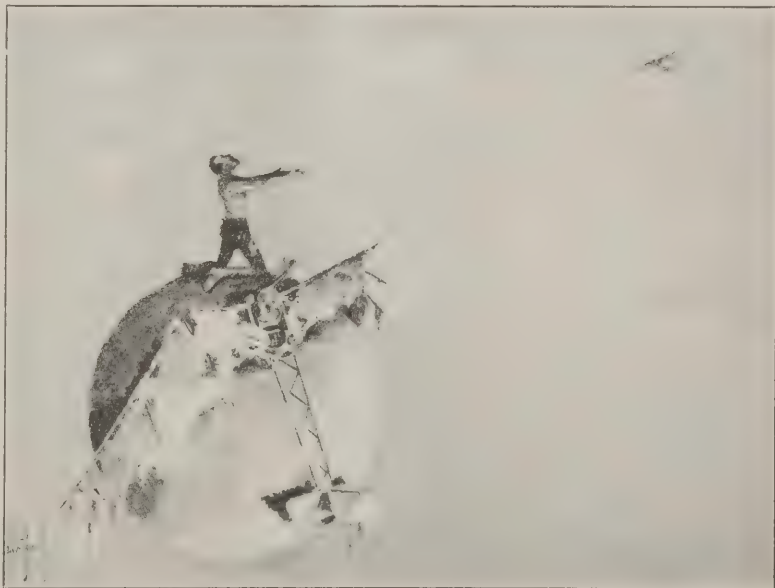
His Friend—What is Tom doing now?

The Thinker—That's what I can't make out. He says he is engaged in the destruction of weeds. Now, that may mean he's smoking a good many cigars or that he is trying to induce some widow to make a second venture, or it may mean that he is doing farm work.

#### Soldiers' Lingo.

The British soldier, in his fondness for slang, calls all shells "souvenirs." But these "souvenirs," says the New York Times, are divided into "will-o'-the-wisps," "humming birds," "Sighing Sarahs," and "porridge pots." "Woolly Marias" are shells that burst in puffs of white, woolly smoke. "Baby" and "mother" are types of British guns. Bullets are "haricot beans." The emergency ration is known as the "imaginary ration," and barbed-wire entanglements are "fly traps" and "spiders' webs." A battle is a "show," and an important battle is a "picture show." To be captured is to be "scuttled," to be wounded is to be "washed out," and to be killed is to be "put in a bag."

The German soldiers call bomb-dropping from an aeroplane "laying eggs." The pilot of the plane is always called "Emil" or "Heinrich," and the observer "Franz." From the observer's nickname the soldiers have coined the verb "franken," to make a military observation, and another "verfranken," to observe mistakenly or carelessly. The enemy's projectiles they call "woolly bears" or "Rowdy Henrys" or "trailer wagons"; and if they are shrapnel, they are known as "sprinkling cans."—Youth's Companion.

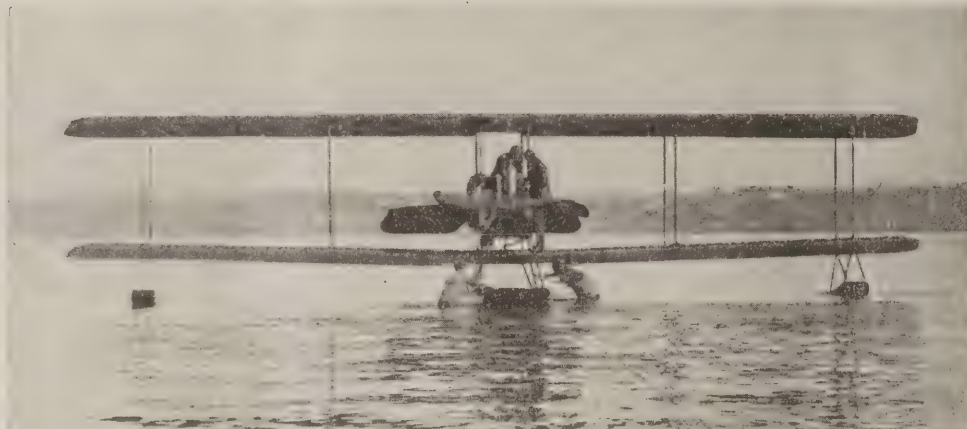


Courtesy Harpers' Weekly.

At Last—a Sail in Sight



## ANOTHER OFFICIAL WORLD'S RECORD



NEW MARTIN MODEL "S" SEAPLANE CARRIED 600-LB. LOAD 12,362 FEET HIGH IN ONE HOUR AND THIRTY MINUTES.

Other notable and unexcelled records established during the rigid Military tests before U. S. Signal Corps were:—

**TWELVE TO ONE GLIDE WITH DEAD MOTOR AND FULLY LOADED.  
FORTY TO SEVENTY-FIVE MILES PER HOUR SPEED RANGE, LOADED.**

Weight of Seaplane, Empty—2300 pounds.

Fuel Capacity—70 gallons. 630 Sq. Ft. Supporting Surface.

Motor Equipment:

THE NOTED SIX CYLINDER HALL-SCOTT 125 H. P.

Motor of Unusual Durability

MODEL S SEAPLANE COMPLETE—\$12,000.00

**GLENN L. MARTIN COMPANY**

**Los Angeles, California**

Hydro and Aeroplane Schooling the year round.

—Winner of Curtiss Marine Trophy—1915—

## MILITARY *Curtiss* TRACTOR

THE MODEL R  
BUILT FOR SPEED  
AND  
WEIGHT CARRYING

POWERED WITH  
CURTISS 160 H. P. MOTOR

SPECIFICATIONS ON REQUEST





(Continued from page 622)

and the models flown with absolute success for quite lengthy distances. The members, who are to be thanked for thus ably representing the club, were Messrs. Ward Pease, Ellis Cook, Thomas Hall and P. Raily. After the models came Captain Wild's stereopticon lecture on aviation in Europe and the United States. He held his audience for a period of an hour and a half with descriptions of his experiences.

Mr. Charles Ahrens informs us that his Anzani motored tractor biplane will soon be nearing completion. Mr. Willis Hitt, President of the I. M. A. C., is working on plans for a small gasoline power plant to be used in the coming Villard competition.

#### University of Buffalo Students May Become Aviators

Students of the University of Buffalo who enlist in the 65th Regiment, National Guard of the State of New York, will have a chance to become aviators in the aviation section of the regiment now developing. There is great interest in preparedness among students and faculty at the University. The instructors are heartily in accord with the movement for adequate preparedness, and are doing all that they can to secure a full battalion of students for the 65th.

#### Cross-Country Flight in Oklahoma

W. D. Praker and G. H. Fritts arrived in Okmulgee, Okla., recently and contemplate joining forces with Messrs. Roberts and Peters in aviation school work in that town. After filling a two weeks' contract in Lawton, Messrs. Parker and Fritts planned a cross-country flight from Oklahoma City to Okmulgee.

#### Lost in the Air Over New York City

There are many better places to meet with an aerial mishap than over New York City, which is a place of canyons when viewed from above, but that is what happened one morning last week to Alexander B. Thaw, 18 years old, of 640 Park avenue. His supply of gasoline gave out as he was flying in a fog far above the city, but he espied Central Park as he came circling down and succeeded in volplaning into the sheepfold.

Thaw, who is a brother of Lieut. William Thaw, of the French Army Aviation Corps, ascended at the Hempstead, L. I. aviation field at 6:20 A. M. intending to fly to Governor's Island. He was accompanied by his mechanic, John Kane. The pilot depended on landmarks for guidance, but on account of a fog which prevailed, he was unable to follow a true course. After flying for 15 minutes at the rate of a mile a minute, he realized that he had lost his way. Then, while he was maneuvering at a height of 5,000 feet, straining his eyes for a glimpse of Governor's Island, the supply of gasoline in the biplane's tanks gave out and the engine stopped.

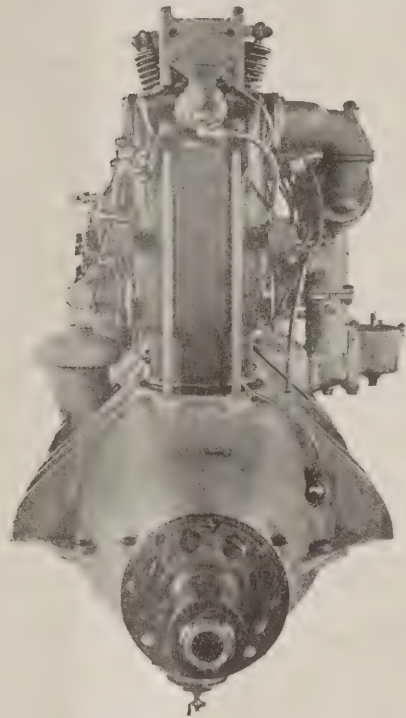
There was but one thing to do then. Thaw kept his head and started volplaning to earth in long spirals, calling to Kane to look out for a landing place. Presently the forms of the skyscrapers shrouded in mist appeared. Then Kane espied the open reaches of Central Park and it was decided to try for that. They volplaned over the enclosure, but in landing one of the wings struck a tree and tipped the machine damaging the planes. Thaw and Kane were shaken up but otherwise were uninjured. The mishap was attributed to a leak in the gasoline tank.

#### Aviator Wild Lecturing on Preparedness

Captain Horace B. Wild, licensed aviator and balloonist, for the past few weeks has been touring the Central States speaking to interested audiences in behalf of aerial preparedness for the nation. Mr. Wild has lately returned from a visit to Europe where he visited one or two of the Allies' large flying fields. What he has seen has thoroughly impressed him with the future of aerial travel, military as well as civilian. He is convinced of the immediate necessity for action on the aviation situation as it is in the United States to-day. The Aerial Reserve, he believes, will be no small factor in the solution of the problem.

"War in the air, with all its horrors," Mr. Wild says, "is upon us. The United States must have an aerial Navy and an aerial coast guard more than equal to the best to adequately defend our far-stretching coast line. This is imperative. Europe has learned the lesson of preparedness, and it has found experience a hard, hard teacher. England and English aviation—France and French aviation—have gone through the turmoils almost of a reformation to bring about the present high effectiveness of their aerial corps. Must we, too, go to the same hard school in which they learned? The cost is insignificant when compared to the possible ransoming sums of our wealthy coast-wise cities."

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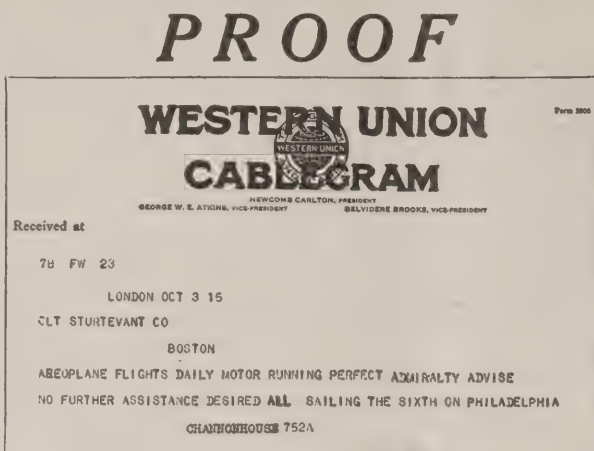
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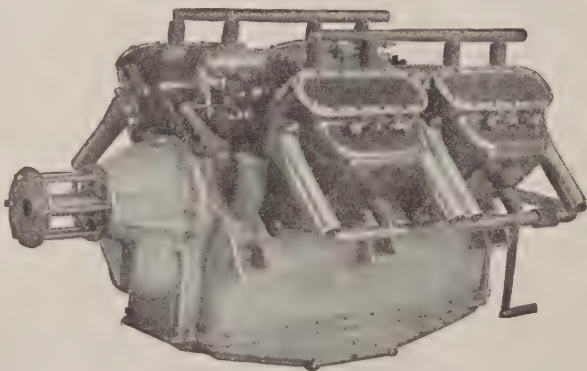
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### Henry Woodhouse Addresses Prominent Gatherings

Mr. Henry Woodhouse, like Mr. Henry A. Wise Wood, is always in "demand" to deliver addresses. He delivers many and is forced to decline many more for lack of time. In the past few days he delivered an address before the League for Political Education, at the Hudson Theatre; one at the McDowell Club, one to the Societ  des Beaux Arts, and one to the presidents of a number of women's clubs. This last was delivered at the home of Mrs. Sidmon McHie, at 390 West End avenue, at the "preparedness" luncheon given by Mrs. McHie to prominent club women to interest them to take up the subject in their respective clubs.

The centerpiece of the luncheon table was the coat of arms of the United States, the shield in red, white and blue, and flowers in the same color were at each place. Above the center of the table hung an armored Curtiss biplane with a model machine gun and bomb-dropping apparatus, and suspended from this was an armored dirigible, also equipped for war. At one end of the floral shield on the table was a model of a superdreadnought, and at the other a submarine, with guns representing the latest models of coast defense.

Mr. Woodhouse spoke of the need of aeroplanes for defense, of the development of military aeronautics and the part that aircraft will play in the reconstruction that will follow the war.

"Aeronautics would make for a world democracy," said Mr. Woodhouse, "but different countries in this war have used them for implements of aggression. In the present condition of our country the aeroplane must be looked to for defense. One man in an aeroplane is equal to 500 soldiers.

One of Mrs. McHie's guests was a peace woman who said that preparedness encouraged war. Mrs. McHie told her that she had given the luncheon to create a feeling among the women that preparedness was the best guarantee of peace.

Among those present were Mrs. Louis Ralston, Vice-President of the New York Theatre Club; Mrs. A. M. Palmer, President of the Rainy Day Club; Miss Florence Guernsey, President of the Eclectic Club; Mrs. Belle de Rivera, Honorary President of the City Federation of Women's Clubs; Mrs. Clarence Burns, President of the Little Mothers' Aid Association; Mrs. Arthur Elliott Fish, President of the Industrial School for Crippled Children; Mrs. Walter D. Truss and Mrs. Paul Roder, of the Eclectic Club, Mrs. Leila Sprague Learned and Mrs. N. McConnell, President of the Mozart Society.

### Women Object to the Noise of the Motors.

The daily flying exhibitions of Aviators Earl Dougherty and H. P. Christofferson at Long Beach, Cal., are so full of interest that whenever the purr of the motors is heard people flock out-of-doors to watch the airmen. Officers of women's clubs and social organizations holding meetings at club rooms along the ocean front have lately been annoyed by the distraction. On a recent occasion more than half of the ladies attending a meeting left the hall to watch the planes as they tore off the miles through the space overhead. Following the meeting, club officials were indignant over the detracting of interest on the part of the members when the rattle of the heavy cylinders proclaimed the overhead presence of one of the by-planes, and a resolution was at once framed to appeal to the city commissioners for the passage of an ordinance which will provide all of the aeroplanes with mufflers.

Should the commissioners pass upon this suggestion, Long Beach will be the first city in the United States to adopt an ordinance of this sort. Visiting aeronauts will probably be surprised some day that upon landing at the beach they will be called upon to appear in court to pay the penalty for the violation of Long Beach's "Blue Sky" law.

### R. V. Morris' Flight over the Flooded District

Raymond V. Morris, formerly of New Haven, has attracted much attention in the West during the last few years on account of spectacular flights. Not long ago he made a daring flight over the flooded section in southern California in an effort to ascertain the extent of the damage done. At a height of 200 feet he inspected the Otay and Tijuana valleys near San Diego in a flying boat. Viewed from the flying boat the district presented a scene of indescribable desolation. Wrecked and devastated houses, and ranches, torn-up fences, demolished buildings, uprooted trees and washed-out bridges showed where the waters had carried everything before them. In one place Mr. Morris saw three bodies, but he was unable to land to recover them.



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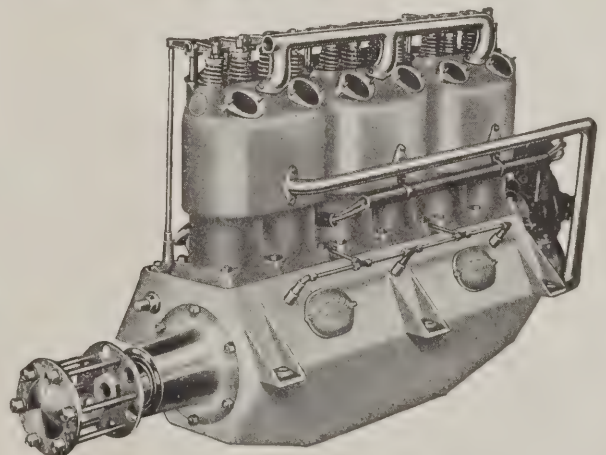
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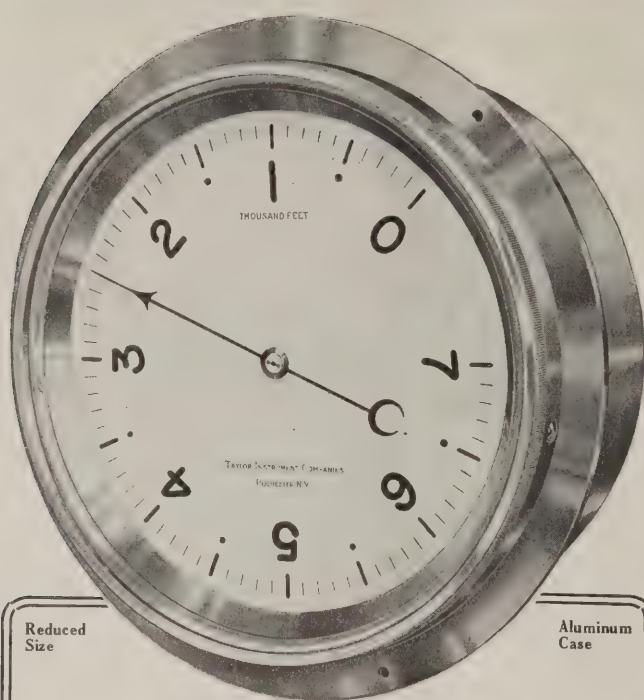
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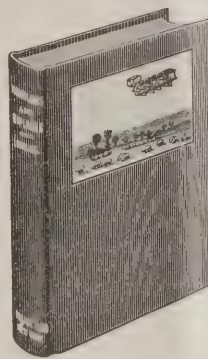
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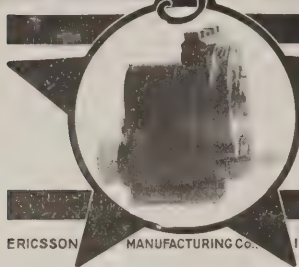
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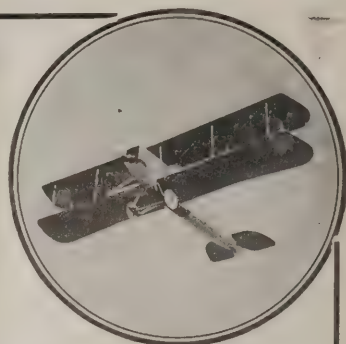
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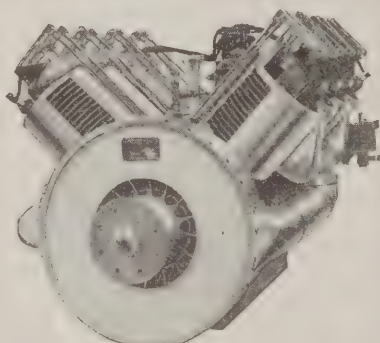
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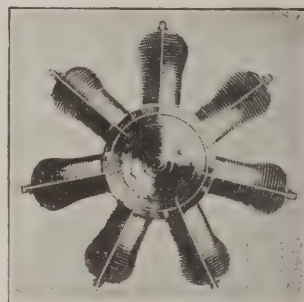
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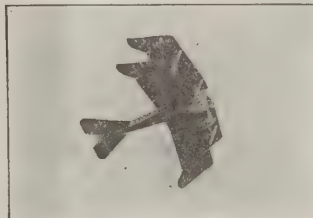
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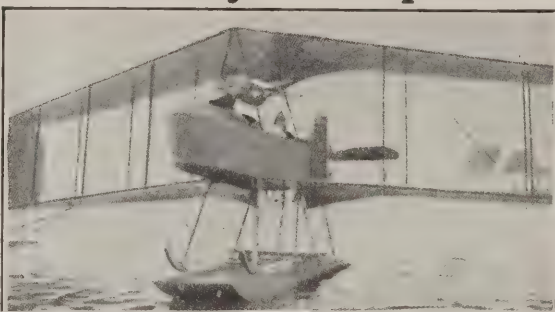


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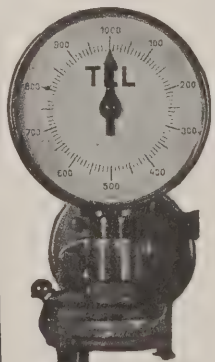
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